

IN THE UNITED STATES PATENT  
AND TRADEMARK OFFICE

APPLICATION FOR  
UNITED STATES UTILITY PATENT

**SCREEN ASSEMBLIES FOR SHALE SHAKERS**

**Extra Set Claims - 1-20 - For PTO Examiner**

INVENTORS

THOMAS C. ADAMS

HAYNES SMITH

JAMES ADAMS

CHARLES NEWTON GRICHAR

KERRY WARD

GEORGE ALEXANDER BURNETT

KENNETH W. SEYFFERT

GUY L. MCCLUNG, III

1           1.    A method for mounting a screen assembly to a screen  
2 mounting structure of a vibratory separator to facilitate sealing  
3 of an interface between the the screen assembly and the screen  
4 mounting structure, the screen mounting structure including a  
5 plurality of support members extending from a first separator side  
6 of the vibratory separator to a second separator side thereof with  
7 material flowable between said sides in a first direction that is  
8 a direction generally parallel to said sides, the screen assembly  
9 having a support and screening material on the support for treating  
10 material introduced to the vibratory separator, the support  
11 including four interconnected sides including two pairs of sides,  
12 a first pair with a first side and a second side and a second pair  
13 with a third side and a fourth side, the first side spaced-apart  
14 from the second side by spaced-apart third and fourth sides, the  
15 first side and the second side generally parallel to the first  
16 separator side and the second separator side upon installation of  
17 the screen assembly in the vibratory separator, the support having  
18 generally screening material thereon, the support having a  
19 plurality of spaced-apart crossmembers extending between and  
20 connected to only one of the pairs of sides, each crossmember not  
21 in contact with and independent of all other crossmembers, the  
22 screen mounting structure including crowning apparatus for forcible  
23 abutment against the third side and the fourth side of the support  
24 to effect bending of the first side and the second side of the  
25 support and thereby effect crowning of the screen assembly within  
26 the vibratory separator, the method comprising

27                locating the screen assembly on the screen mounting  
28           structure,

29                positioning the screen assembly with respect to the  
30           screen mounting structure so that the crossmembers are all  
31           either generally transverse to or all generally parallel to  
32           the first direction, and

33                forcing the first and second sides of the support

34 down with the crowning apparatus to effect crowning of the  
35 screen assembly, the support rigid yet sufficiently flexible  
36 so that with the screen assembly in a crowned configuration  
37 the third side and the fourth side each along substantially  
38 all of the length thereof sealingly contact a surface of the  
39 screen mounting structure.

1 2. The method of claim 1 wherein the plurality of spaced-  
2 apart crossmembers is two crossmembers generally parallel to the  
3 third side and the fourth side.

1 3. The method of claim 1 wherein the plurality of spaced-  
2 apart crossmembers is five crossmembers generally parallel to the  
3 first direction.

1 4. The method of claim 1 wherein the first side and the  
2 second side are each made of material less rigid than material of  
3 the third side and the fourth side.

1 5. The method of claim 1 wherein the first side has at least  
2 a portion thereof made of material less rigid than material of the  
3 third side and the fourth side.

1 6. The method of claim 1 further comprising  
2 connecting a seal member at a first location of an  
3 exterior of at least one of the first side or the second side  
4 to remedy ineffective sealing at said first location.

1 7. The method of claim 6 wherein the seal member has at  
2 least a portion thereof within a recess at the first location.

1 8. The method of claim 1 wherein the screen mounting  
2 structure has a body with at least one upwardly projecting member

3 projecting upwardly from the body member, said at least one  
4 upwardly projecting member sized and configured so it is receivable  
5 in a corresponding hole in the support, the method further  
6 comprising

7           positioning the screen assembly on the screen  
8 mounting structure so that the at least one upwardly  
9 projecting member is received in the corresponding hole of the  
10 support.

1           9. The method of claim 8 wherein the at least one upwardly  
2 projecting member is a plurality of spaced-apart upwardly  
3 projecting members and wherein the at least one hole in the support  
4 is a plurality of spaced-apart holes, each for receiving a  
5 corresponding upwardly projecting member.

1           10. The method of claim 8 wherein the corresponding hole in  
2 the support is in a crossmember of the support.

1           11. The method of claim 1 wherein the vibratory separator is  
2 a shale shaker for separating components of drilling material  
3 introduced thereto, the drilling material including drilling fluid  
4 and drilled cuttings, the shale shaker having a basket, the screen  
5 mounting structure on the basket, the support having a plurality of  
6 spaced apart support holes therethrough, each hole of the plurality  
7 of spaced apart support holes for receiving part of a fastener used  
8 for releasably connecting the screen assembly to the screen  
9 mounting structure, the screen mounting structure having a  
10 plurality of spaced-apart deck holes corresponding to the plurality  
11 of spaced-apart support holes through the support, and fasteners  
12 connecting the screen assembly to the screen mounting structure,  
13 each fastener passing through the screening material, through a  
14 support hole, and into a deck hole, the method further comprising  
15           connecting the support to the screen mounting

16 structure with the fasteners.

1 12. The method of claim 11 wherein the fasteners are from the  
2 group consisting of threaded fasteners, screens, bolts, locking  
3 fasteners, finger expansion fasteners, air injection fasteners, and  
4 friction-fit fasteners.

1 13. The method of claim 11 wherein the fasteners are  
2 adhesively secured in place.

1 14. The method of claim 11 wherein the screening material  
2 comprises a plurality of layers of screen mesh.

1 15. The method of claim 11 wherein the screen assembly has on  
2 the support a perforated plate.

1 16. The method of claim 11 wherein the sides of the support  
2 comprise hollow tubular members.

1 17. The method of claim 1 wherein all of the crossmembers are  
2 generally transverse to the first direction, the material  
3 introduced to the vibratory separator containing solids not  
4 passable through the screening material, the solids movable on a  
5 top of the screening assembly by the vibratory separator, the  
6 method further comprising  
7 moving the solids uniformly on the top of the  
8 screening assembly.

1 18. The method of claim 17 wherein the material is drilling  
2 material and the solids include drilled solids.

1           19. The method of claim 17 wherein the solids are moved on  
2 the top of the screen assembly without the formation of significant  
3 dead zones on the top of the screen assembly.

1           20. A design for a support for a screen assembly  
2 substantially as described and illustrated herein.

1

IN THE UNITED STATES PATENT  
AND TRADEMARK OFFICE

APPLICATION FOR  
UNITED STATES UTILITY PATENT

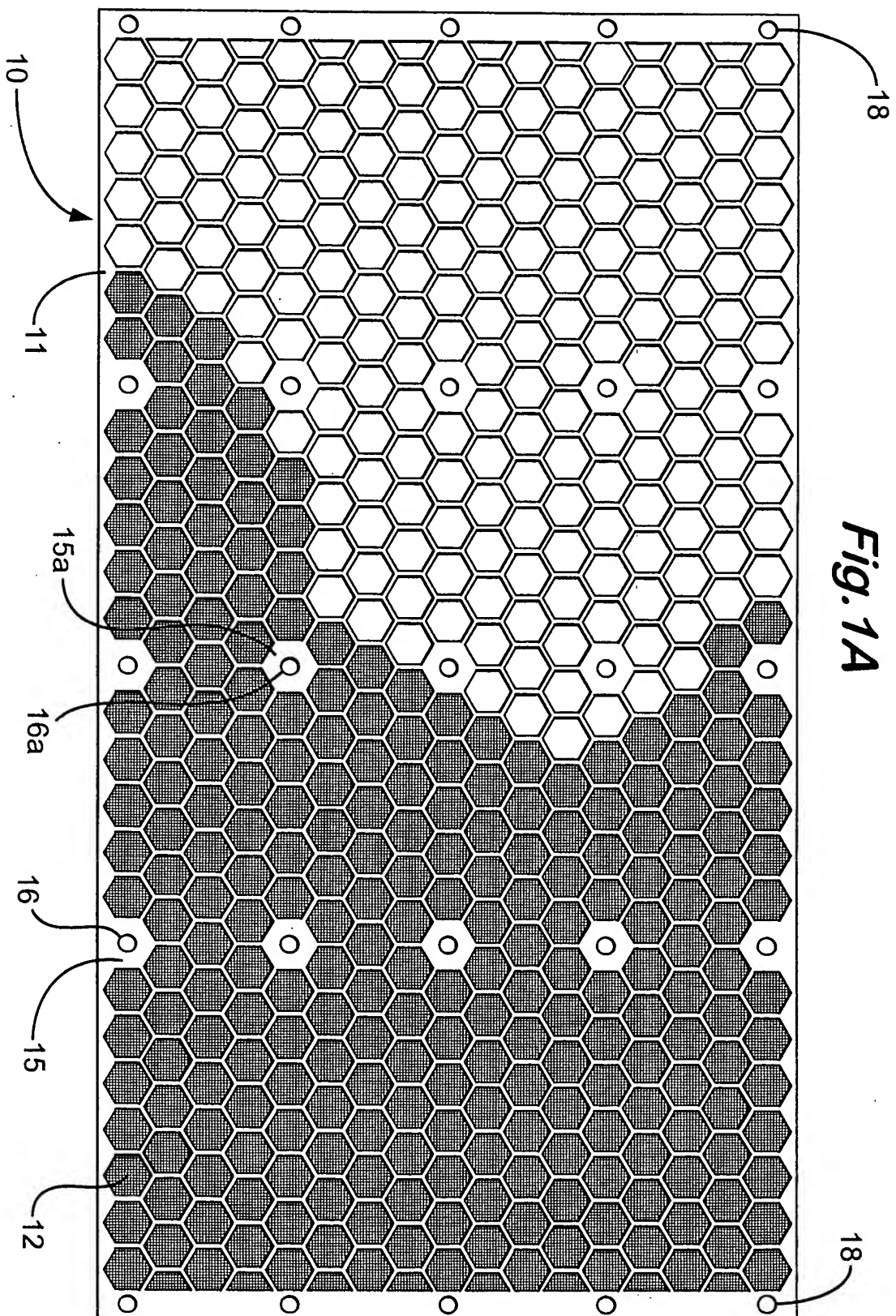
**SCREEN ASSEMBLIES FOR SHALE SHAKERS**

Extra Set Drawings - 41 Sheets - For PTO Examiner

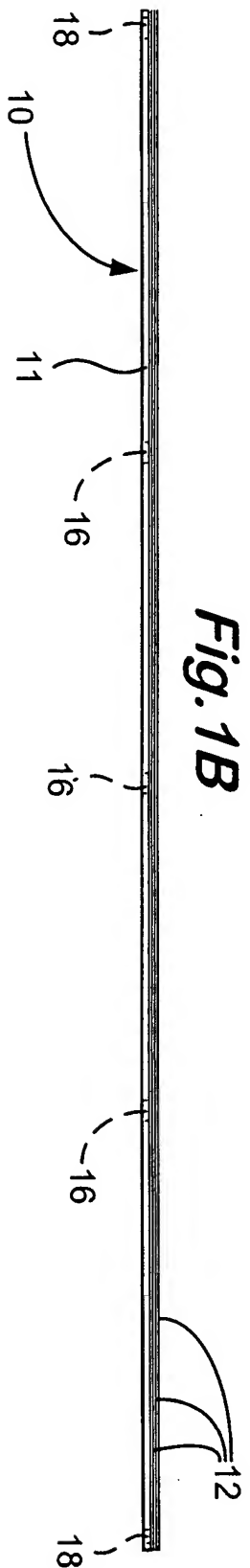
INVENTORS

THOMAS C. ADAMS  
HAYNES SMITH  
JAMES ADAMS  
CHARLES NEWTON GRICHAR  
KERRY WARD  
GEORGE ALEXANDER BURNETT  
KENNETH W. SEYFFERT  
GUY L. MCCLUNG, III

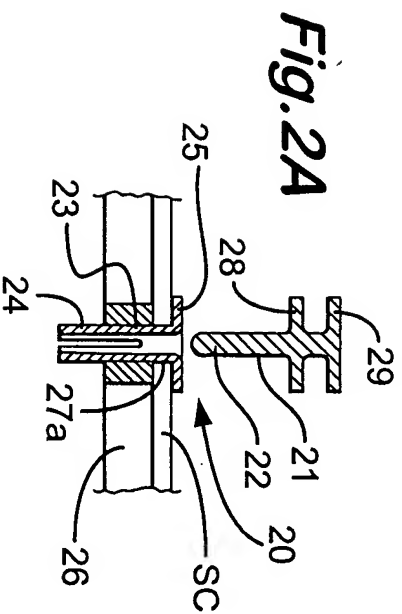
*Fig. 1A*



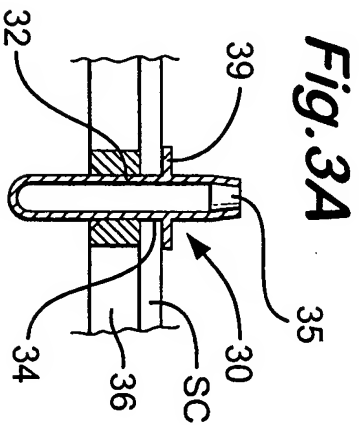




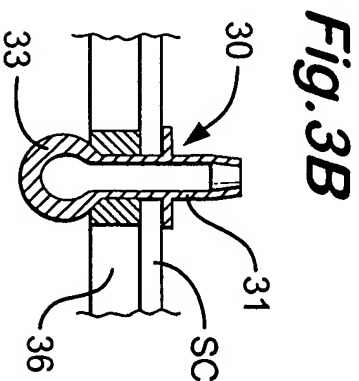
**Fig. 1B**



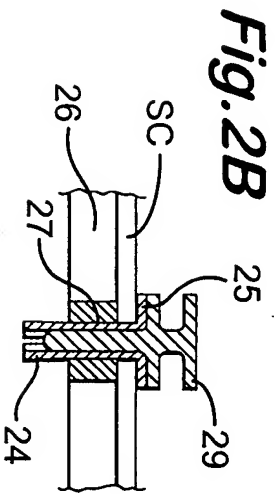
**Fig. 2A**



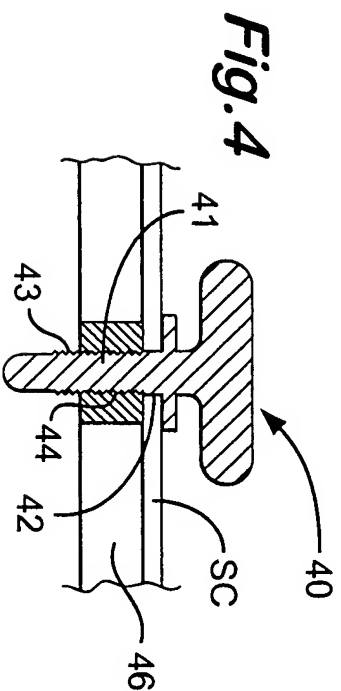
**Fig. 3A**



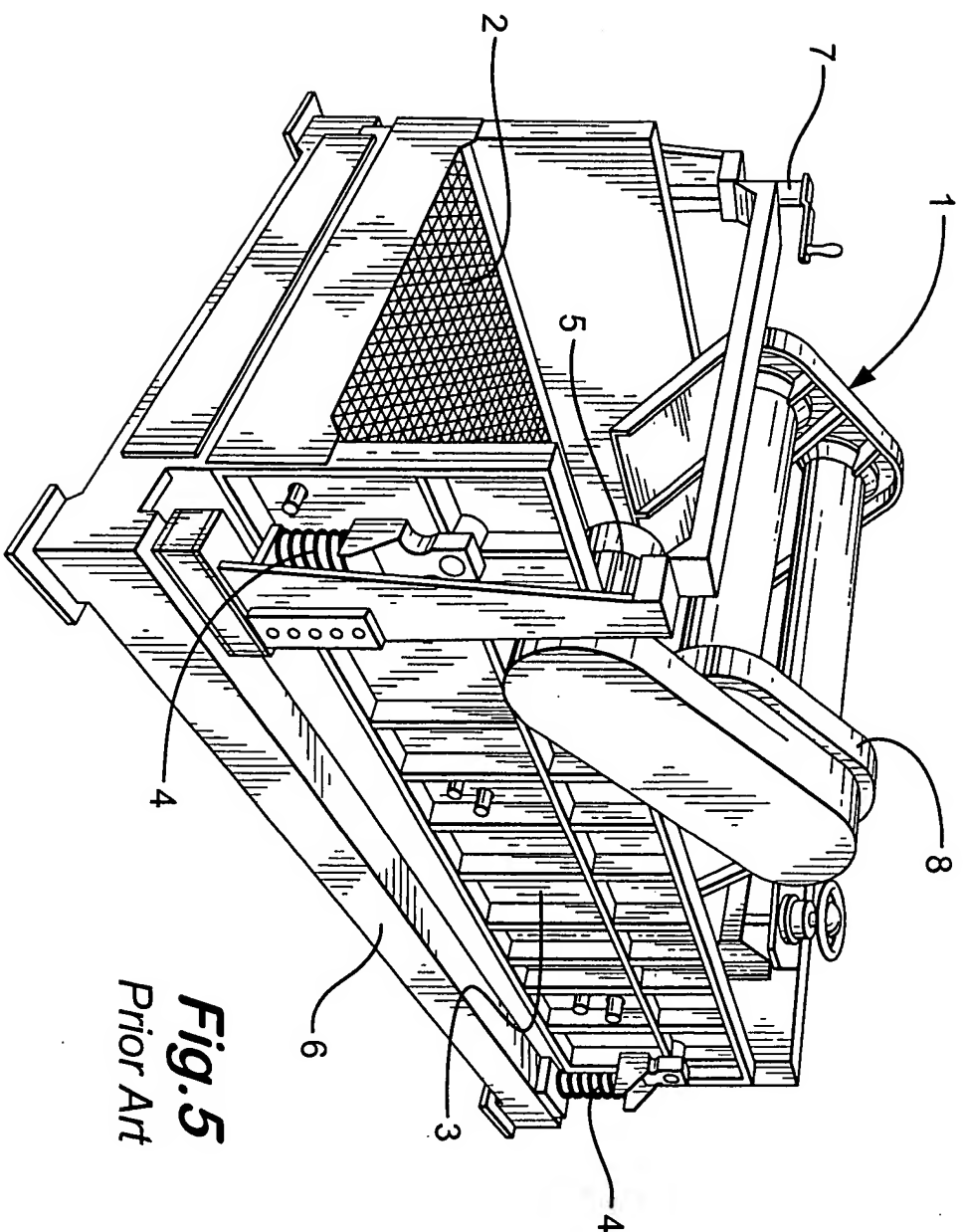
**Fig. 3B**



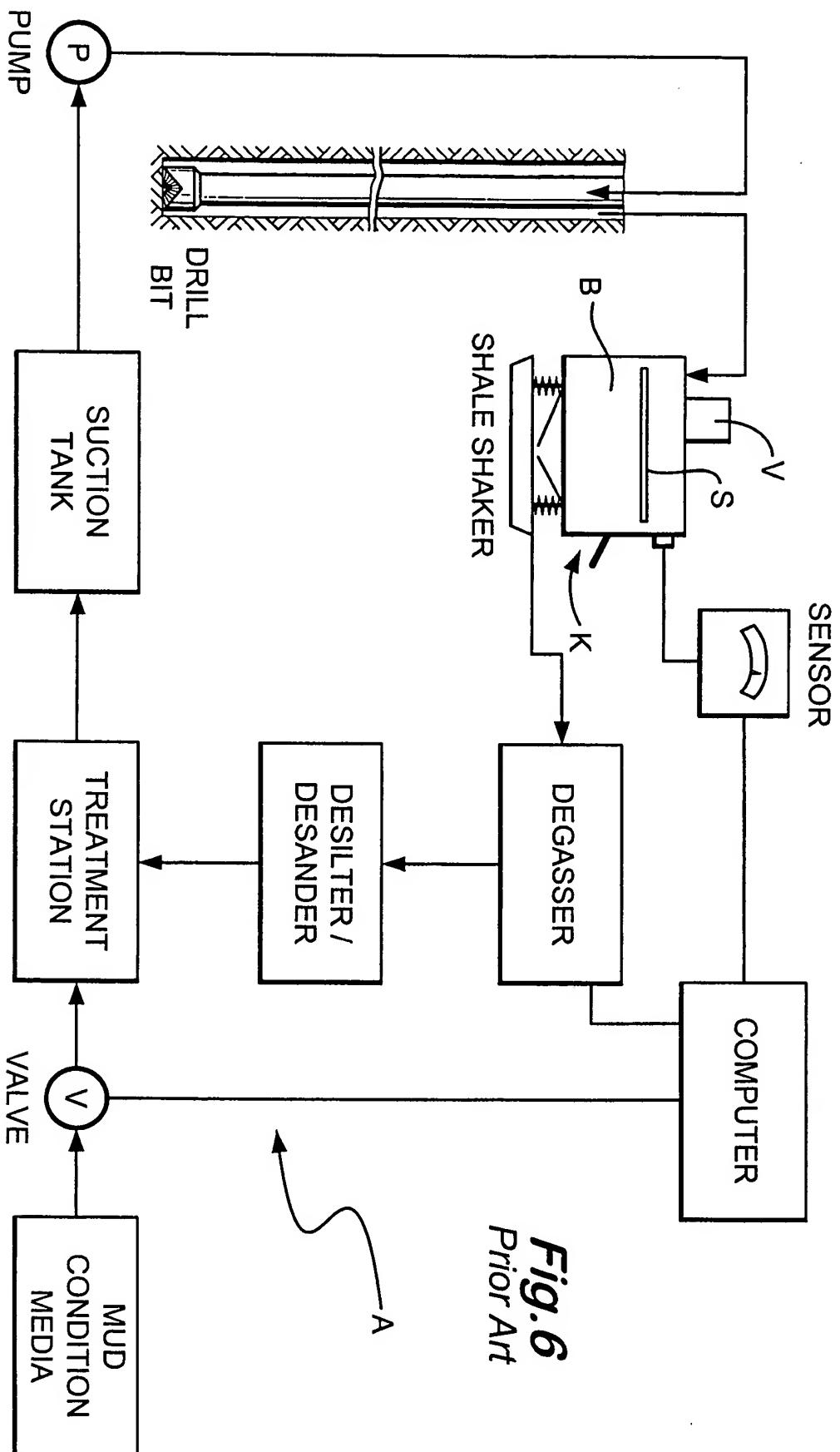
**Fig. 2B**



**Fig. 4**



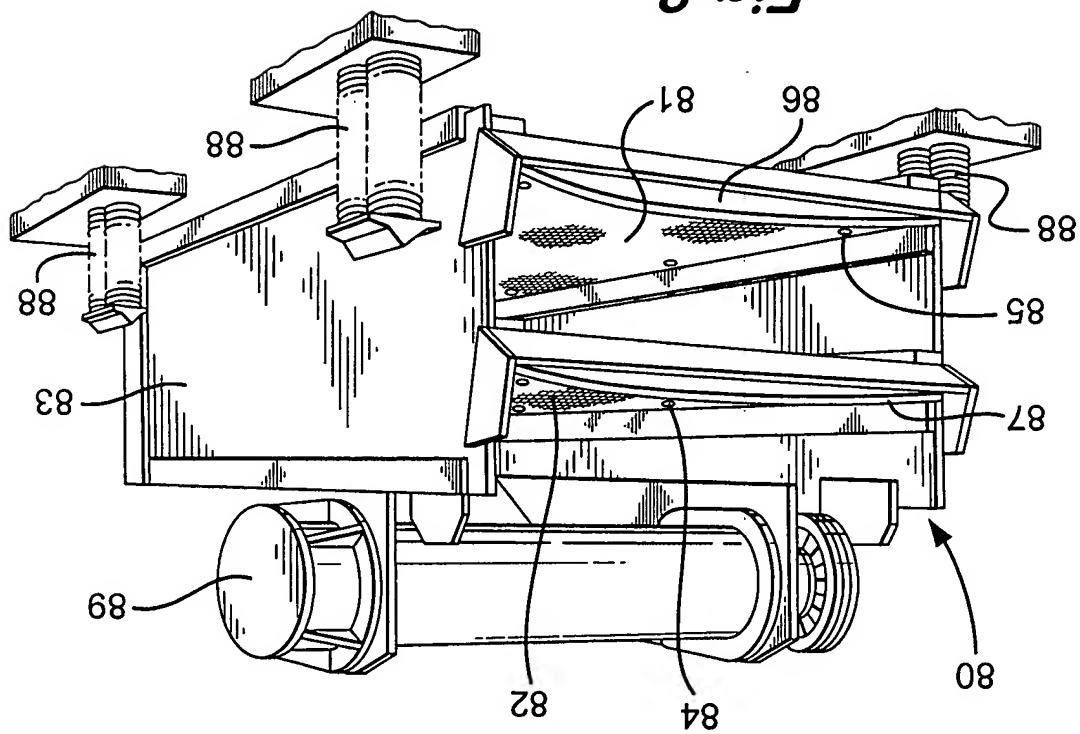
**Fig. 5**  
Prior Art



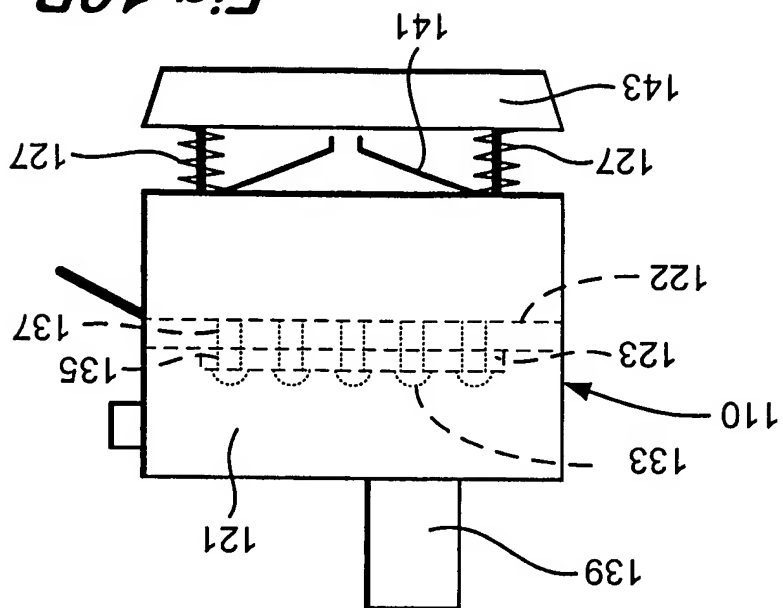
**Fig. 6**  
Prior Art

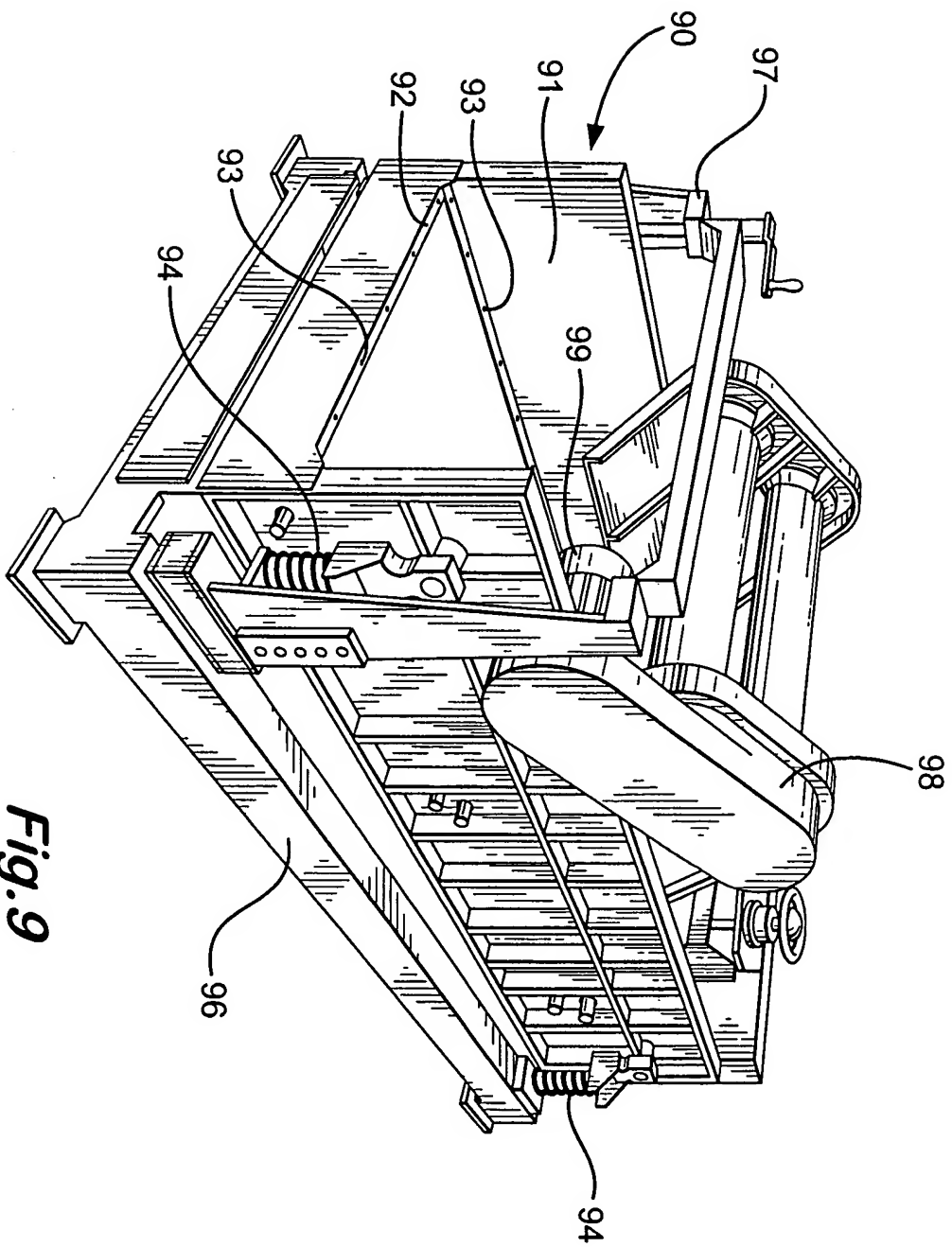


**Fig. 8**

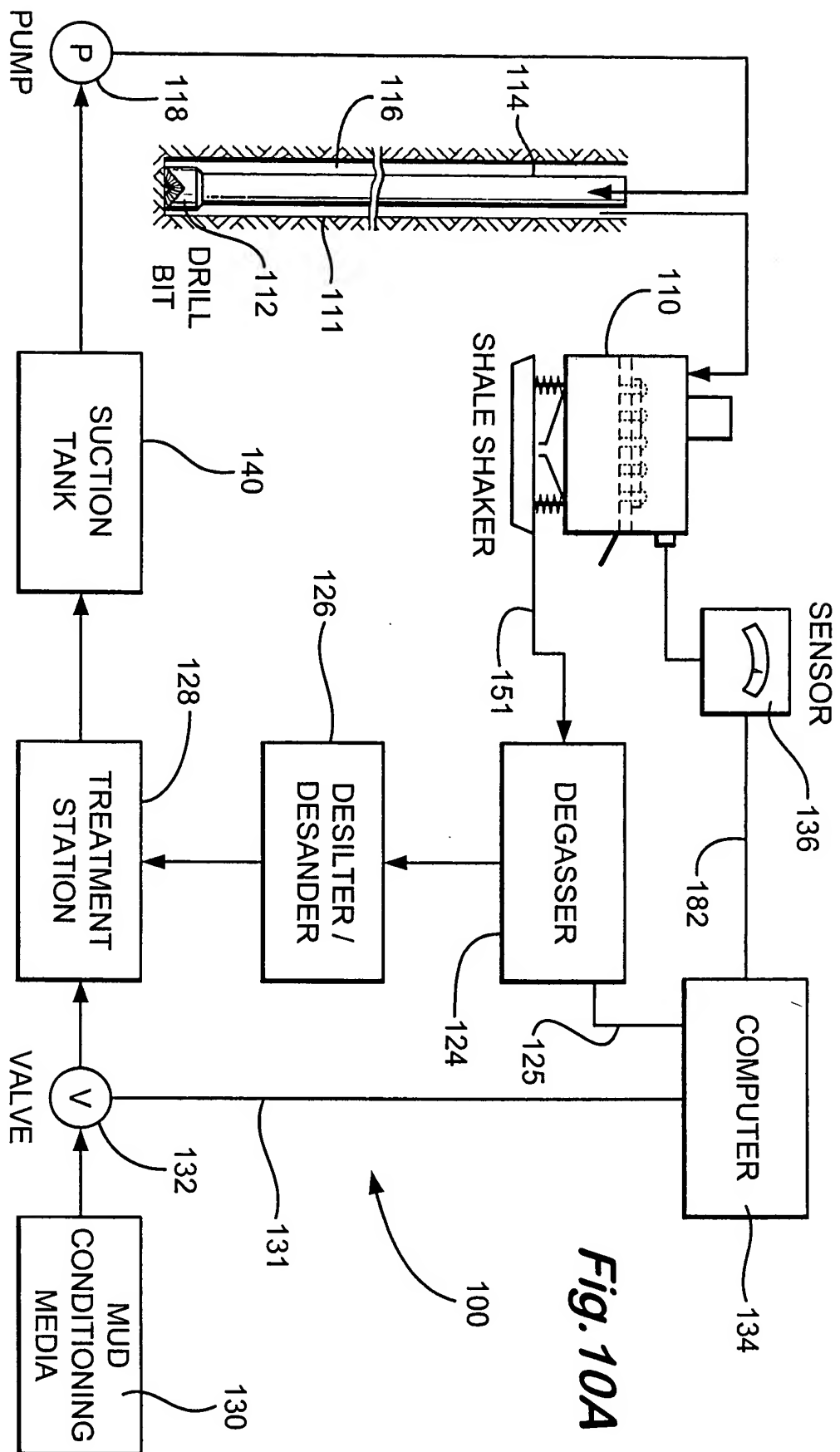


**Fig. 10B**

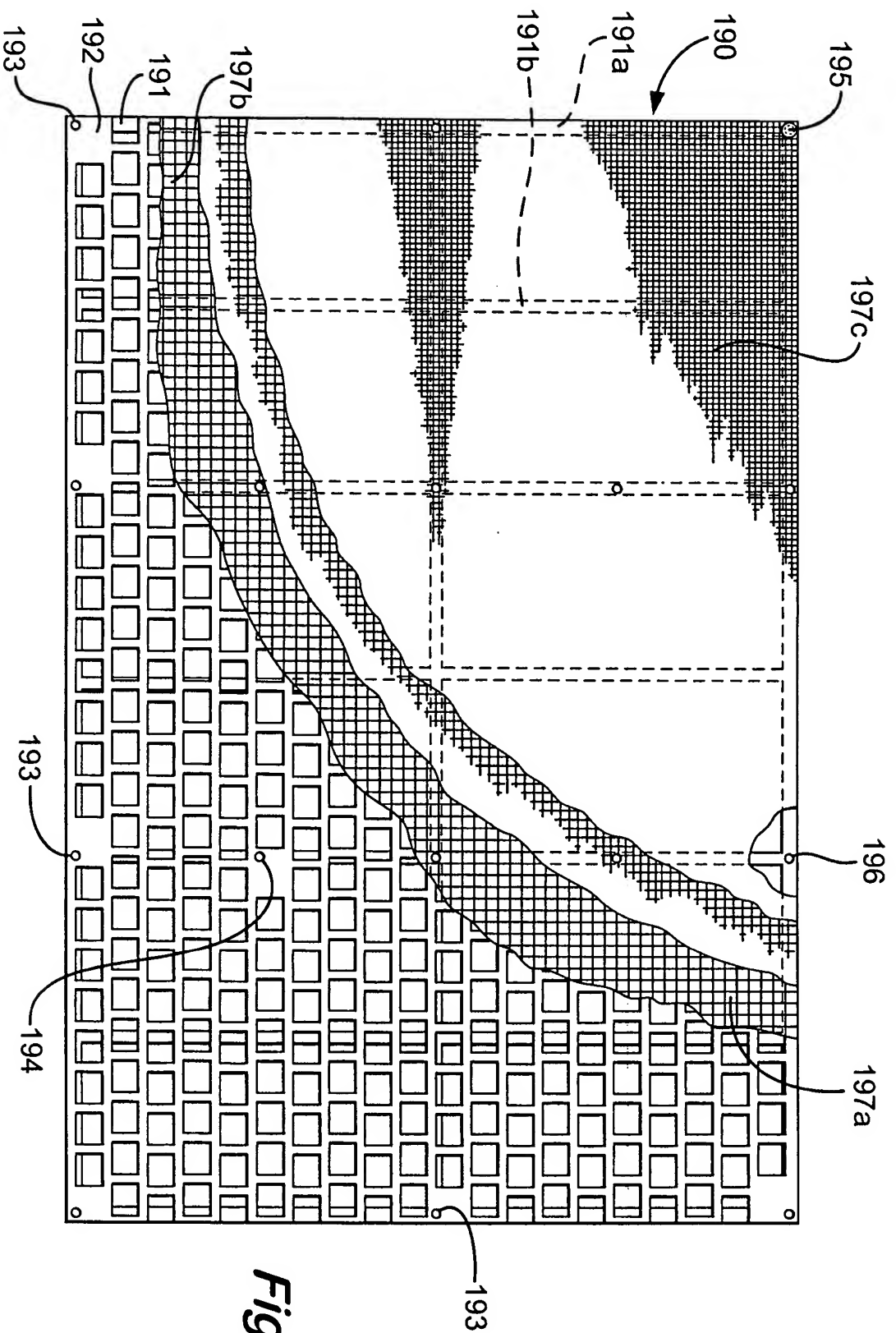




**Fig. 9**

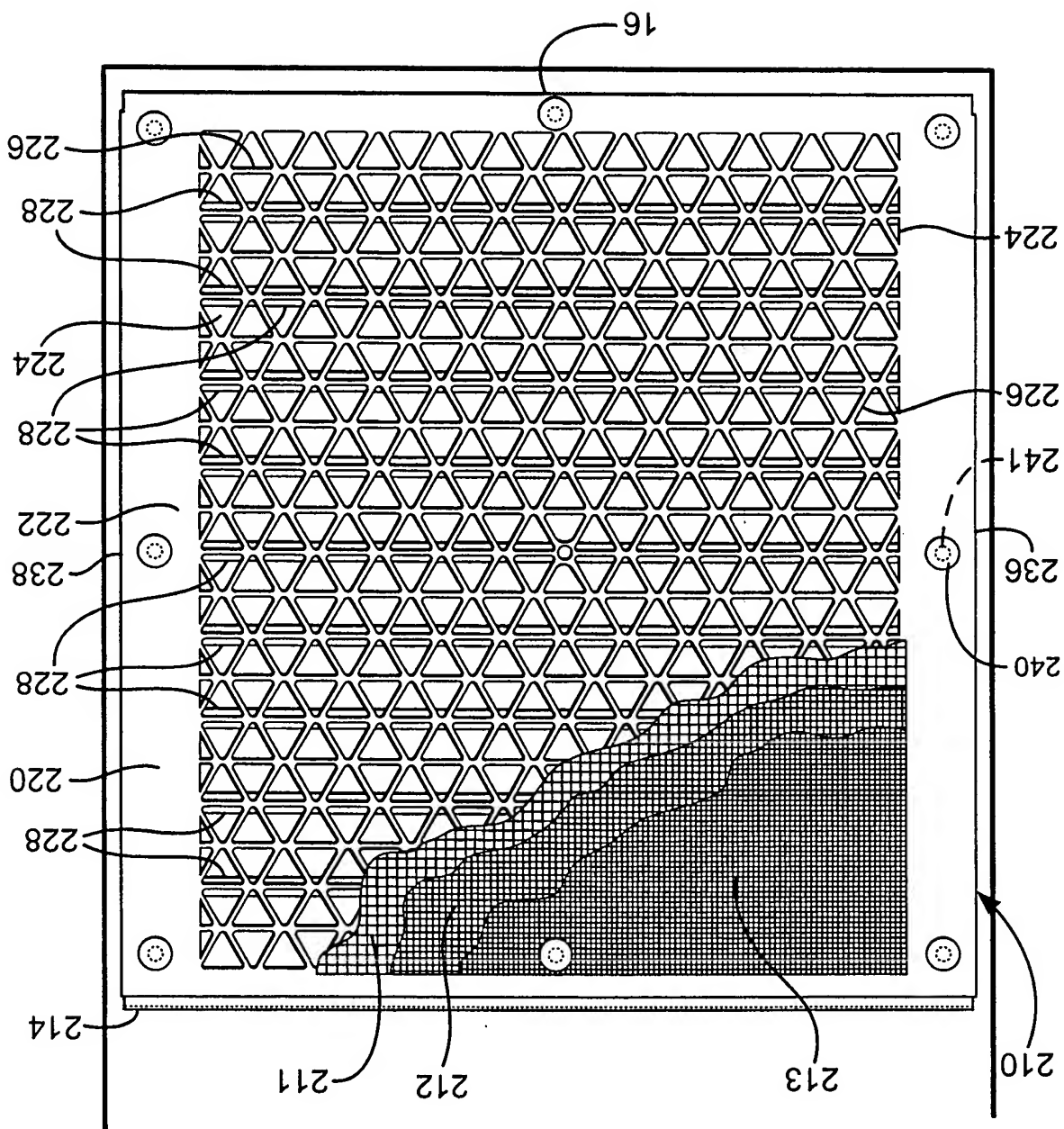


**Fig. 10A**

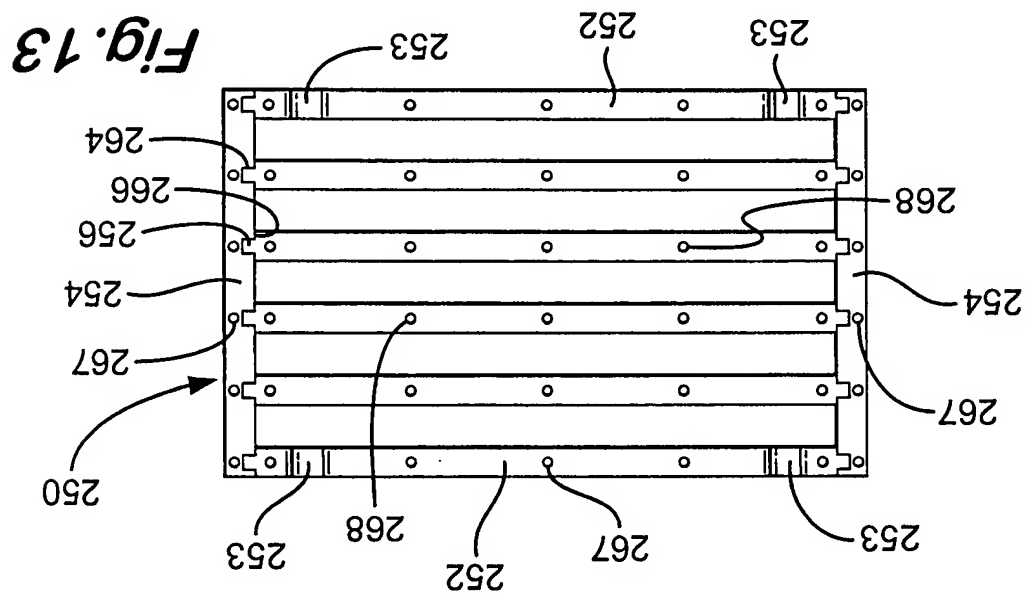
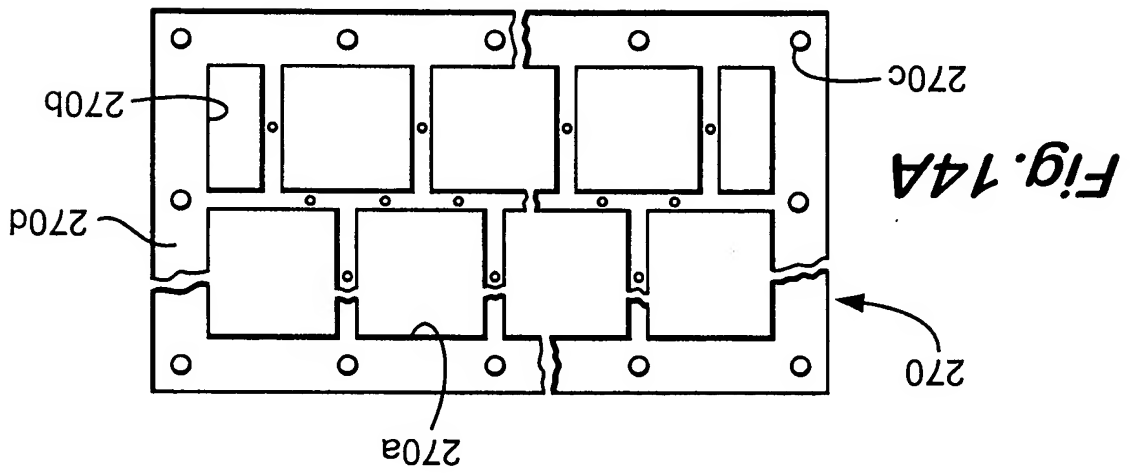
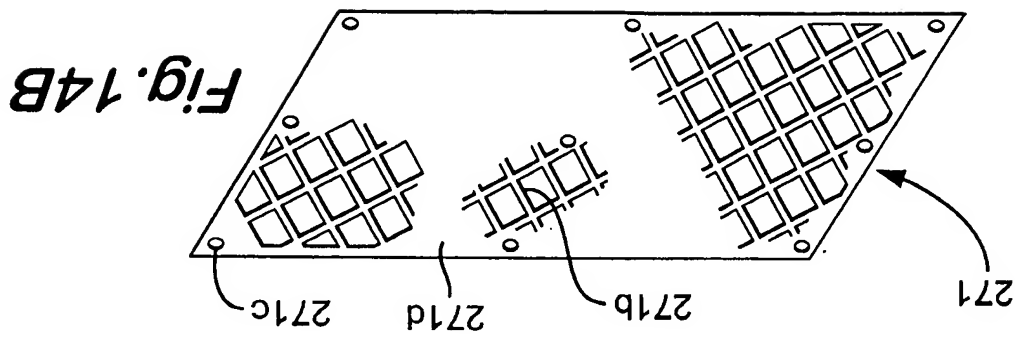


**Fig. 11**



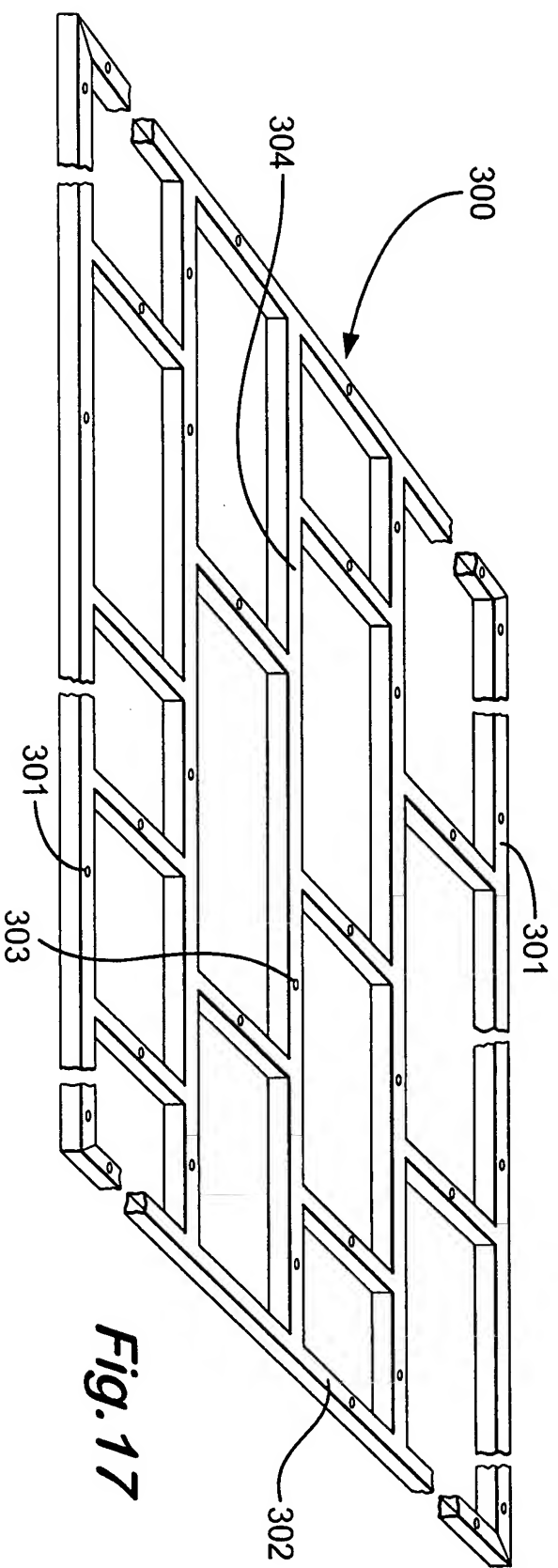
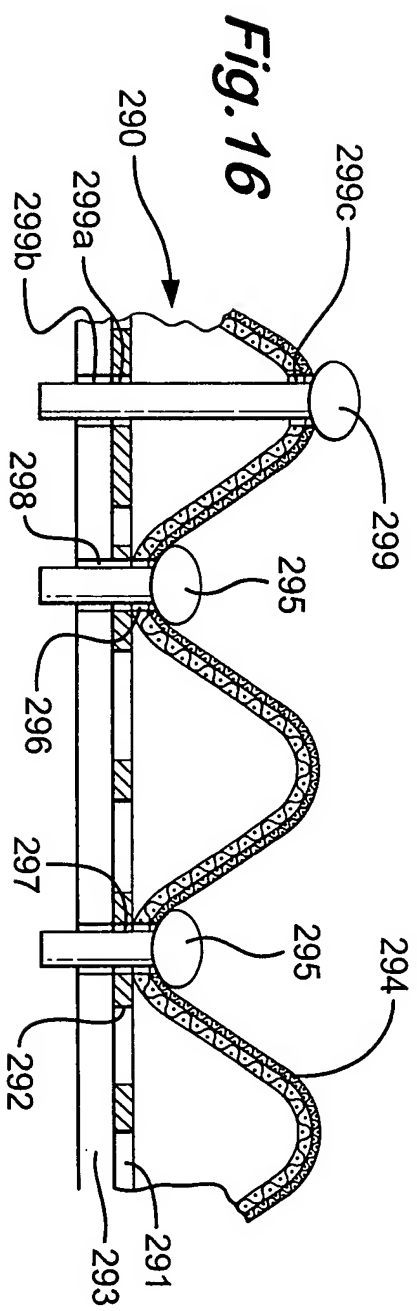


**Fig. 12**

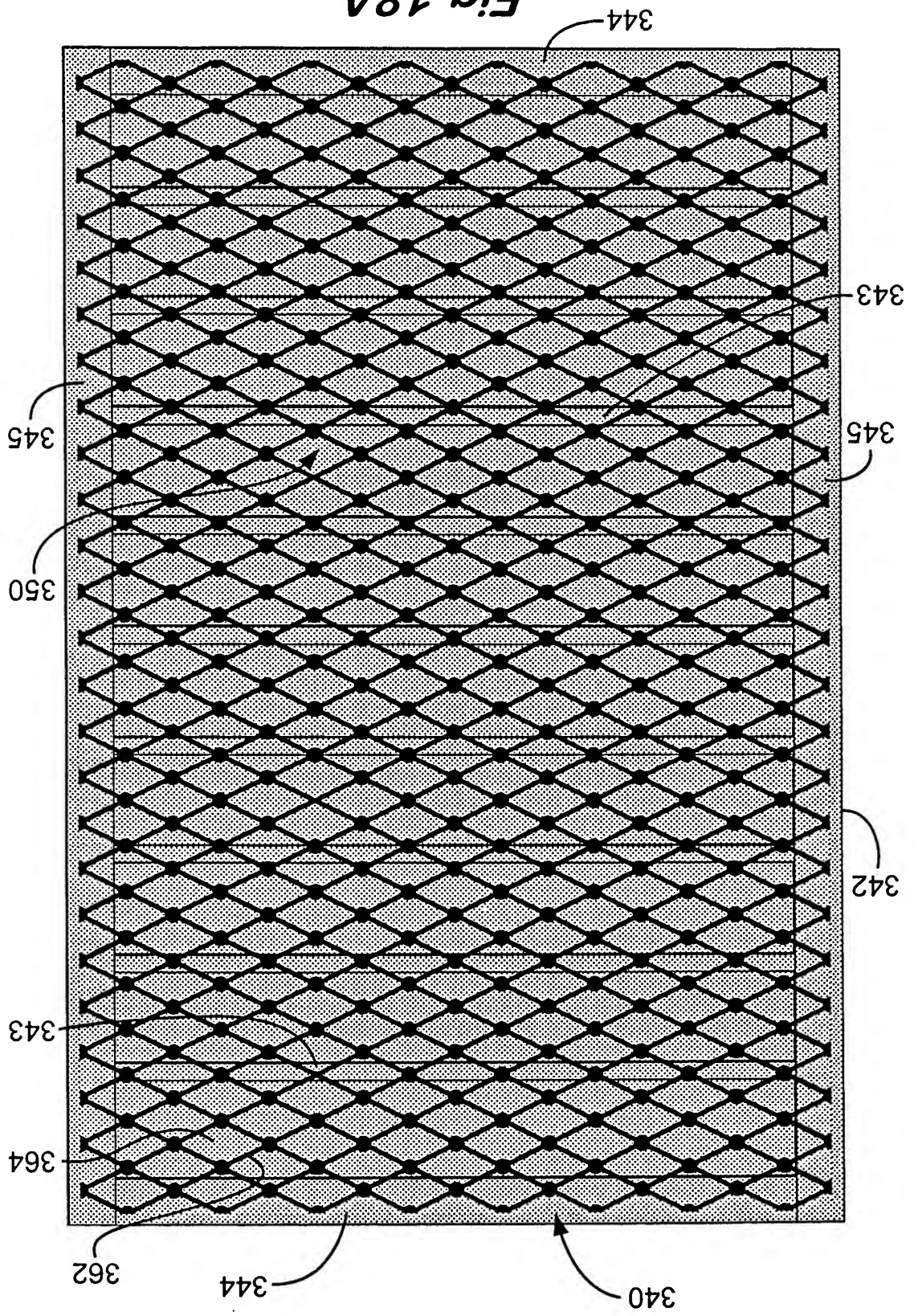


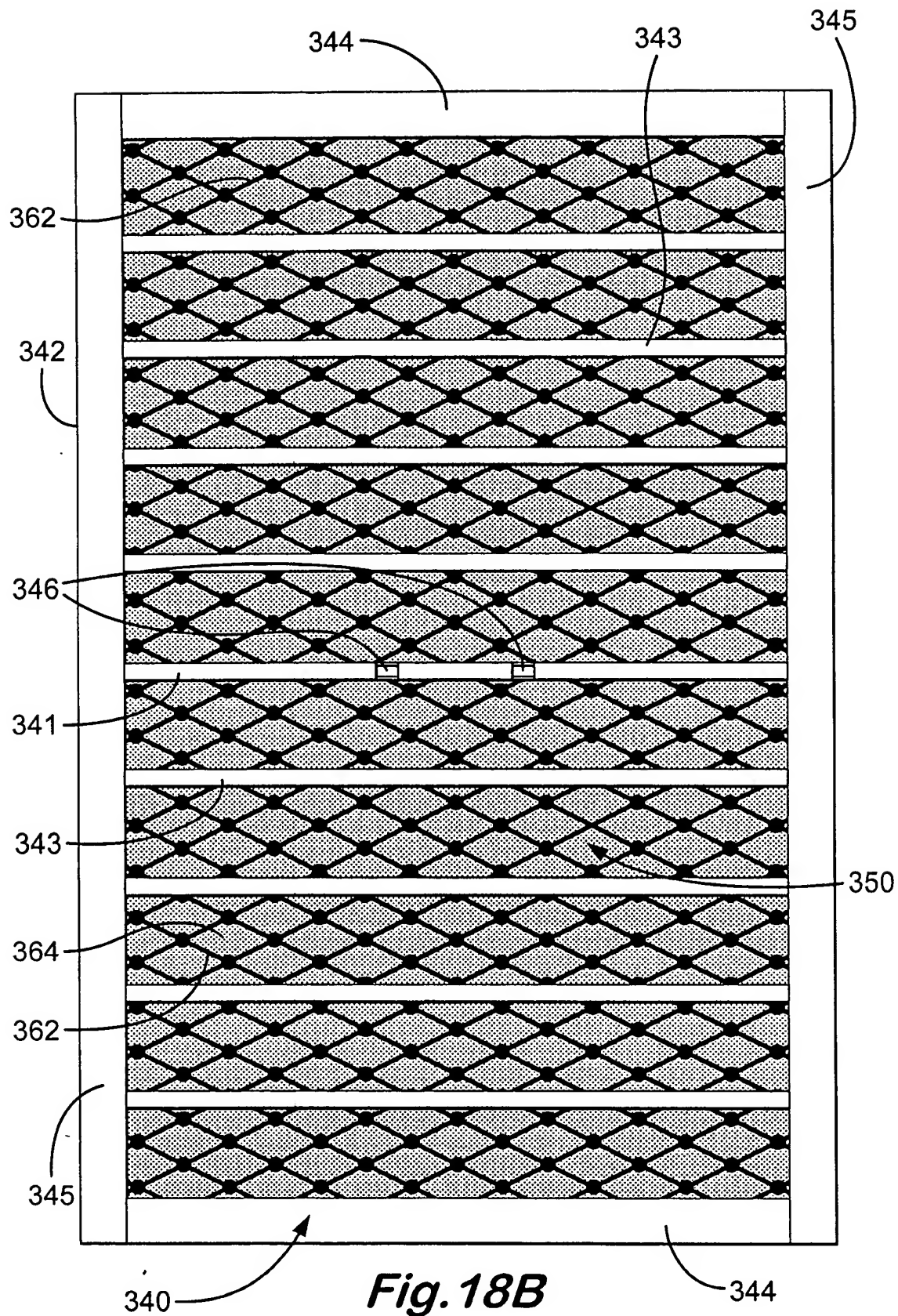


**Fig. 15**



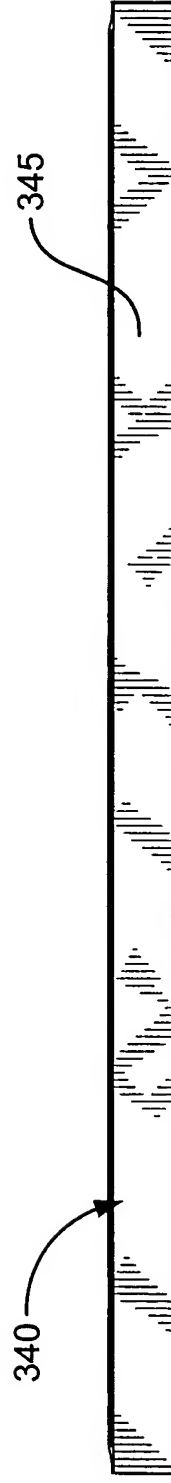
*Fig. 18A*



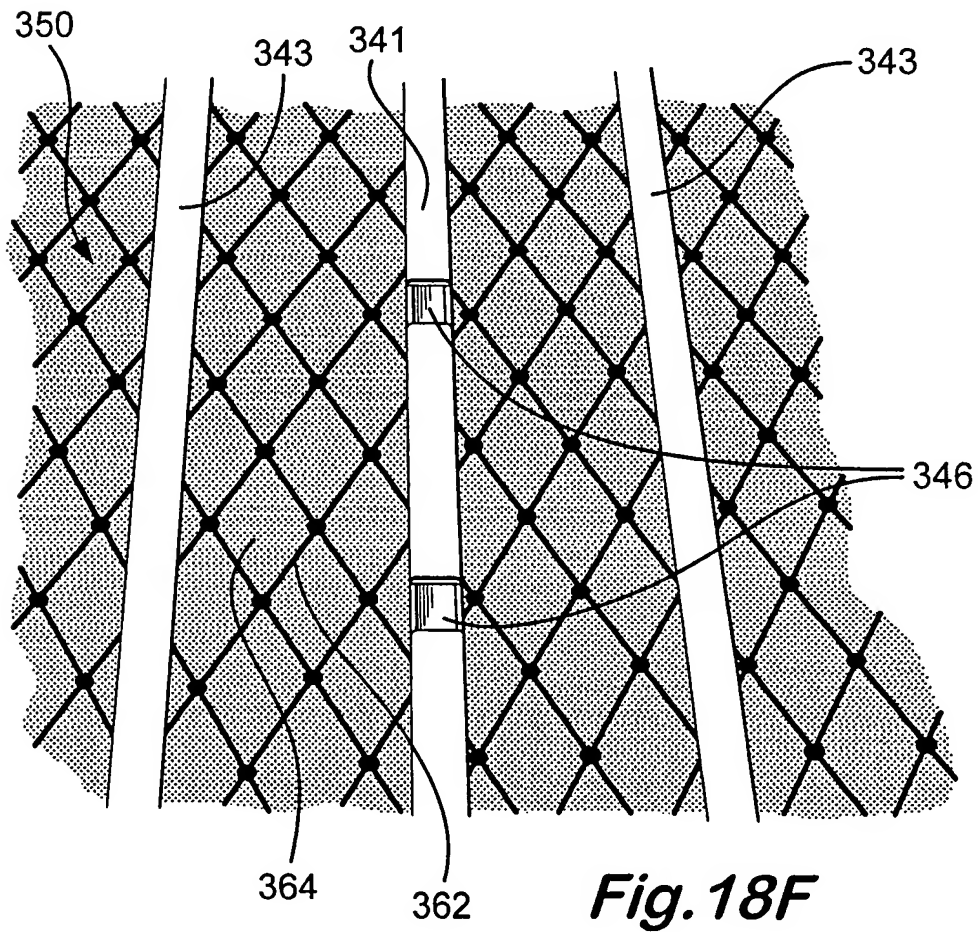
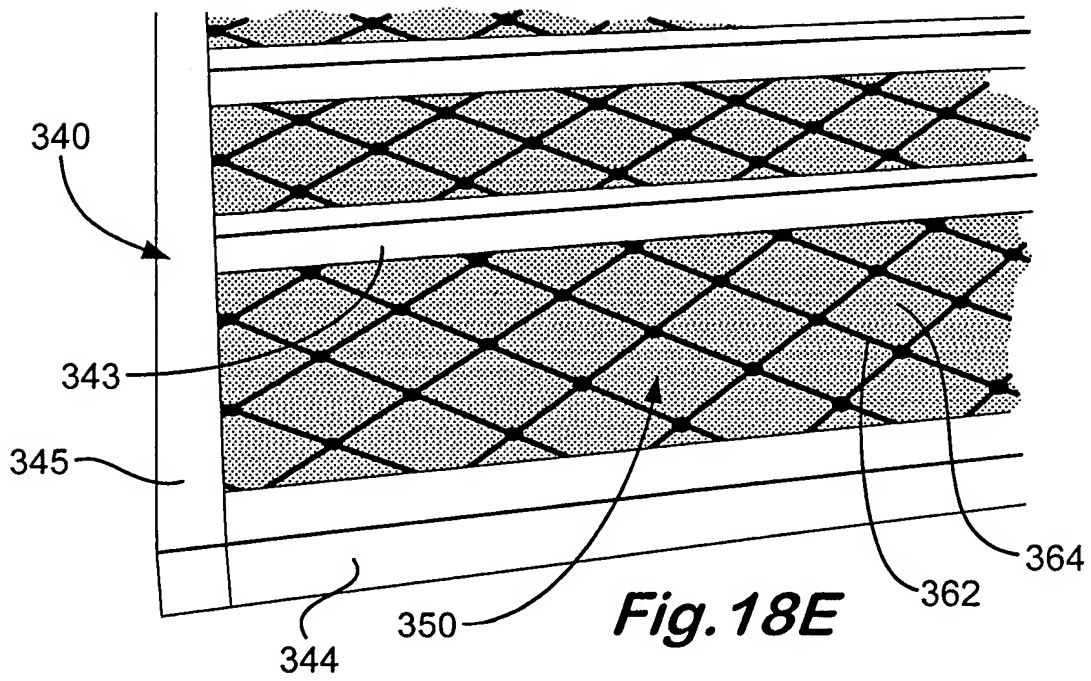




*Fig. 18C*

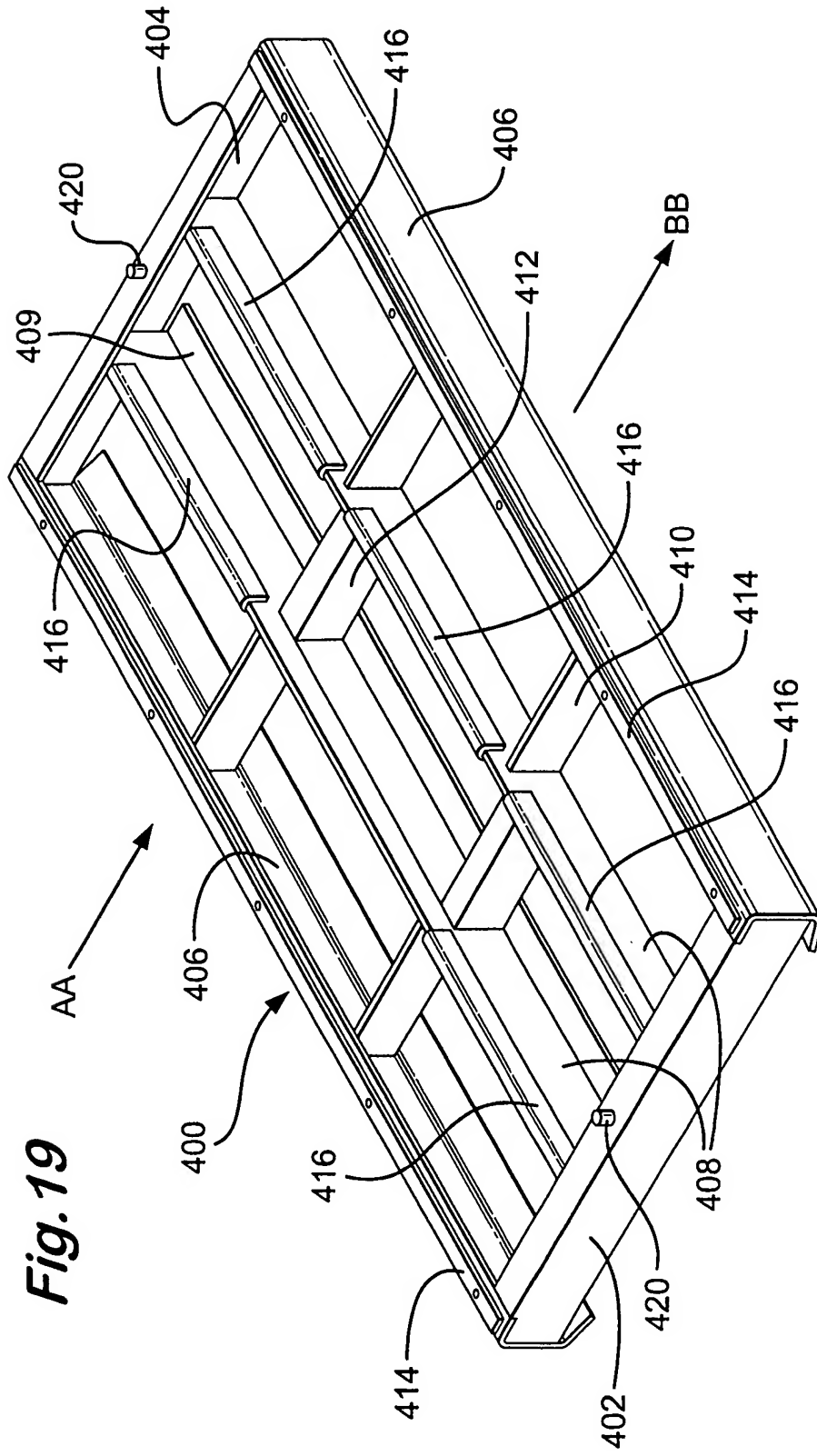


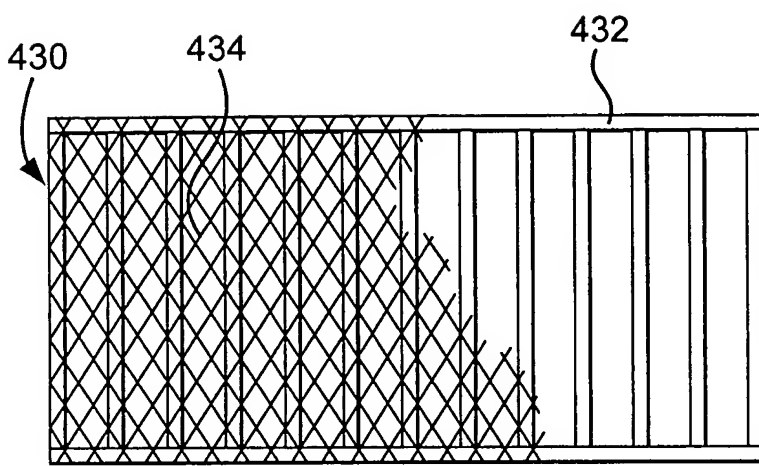
*Fig. 18D*



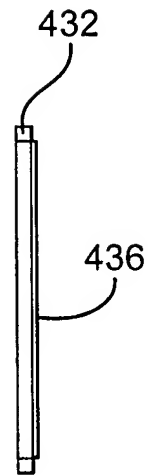


**Fig. 19**





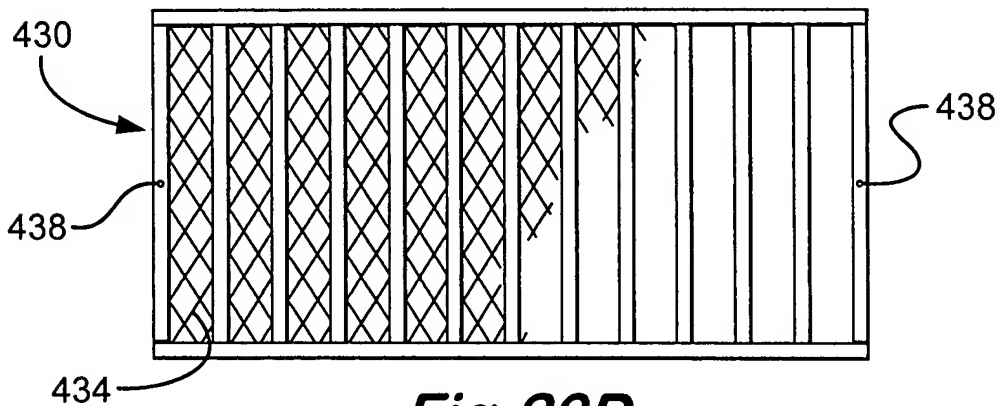
**Fig. 20A**



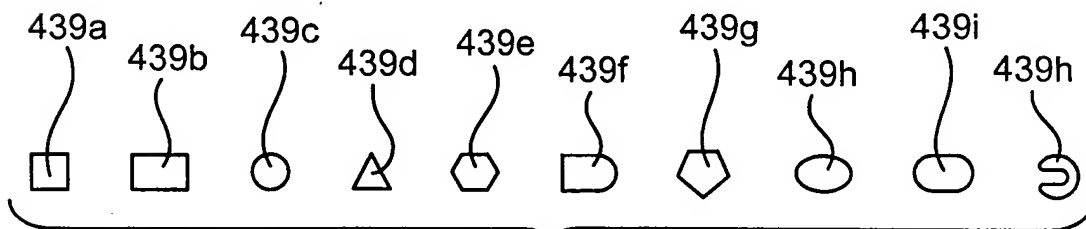
**Fig. 20B**



**Fig. 20C**



**Fig. 20D**



**Fig. 20E**

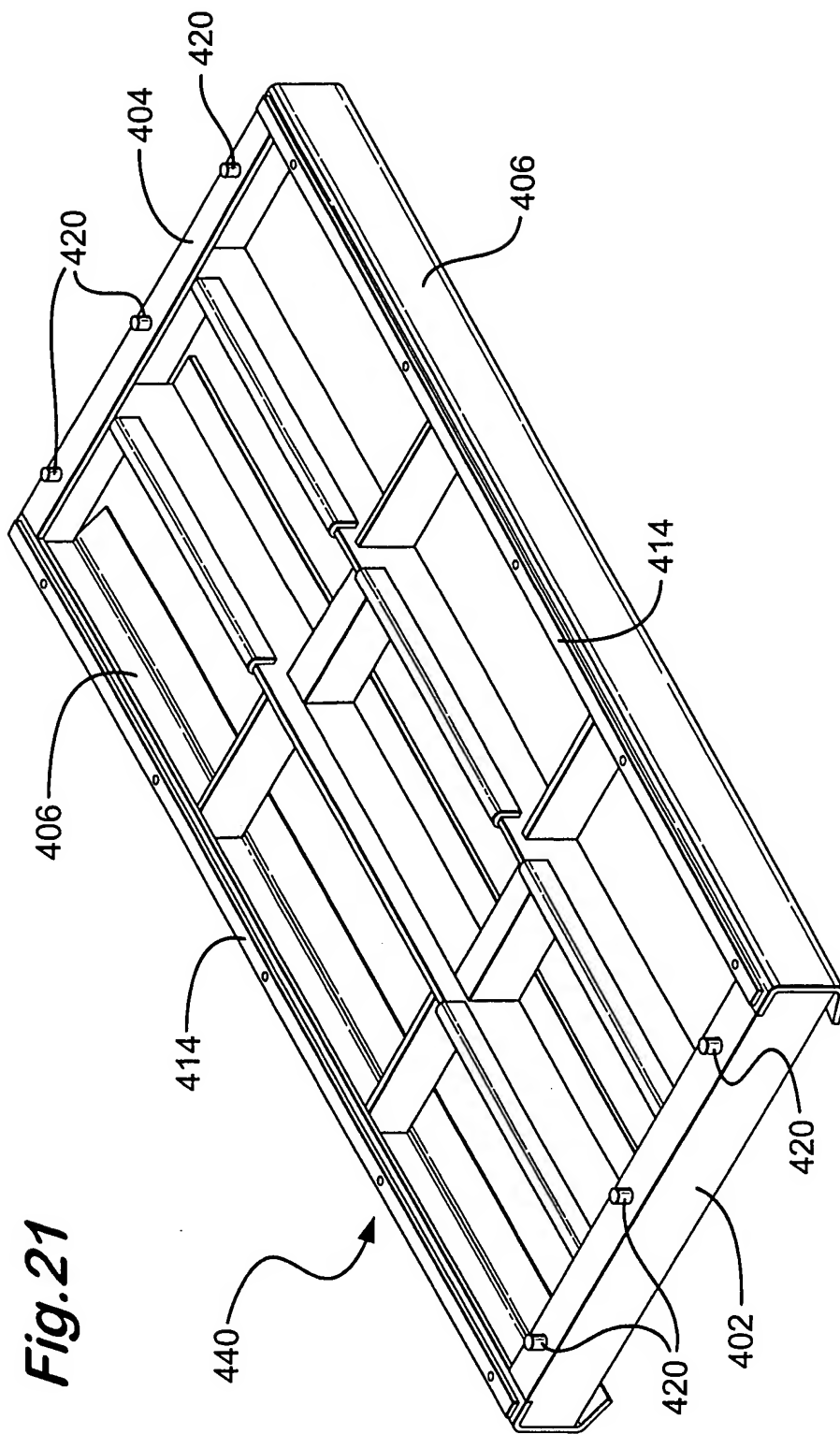
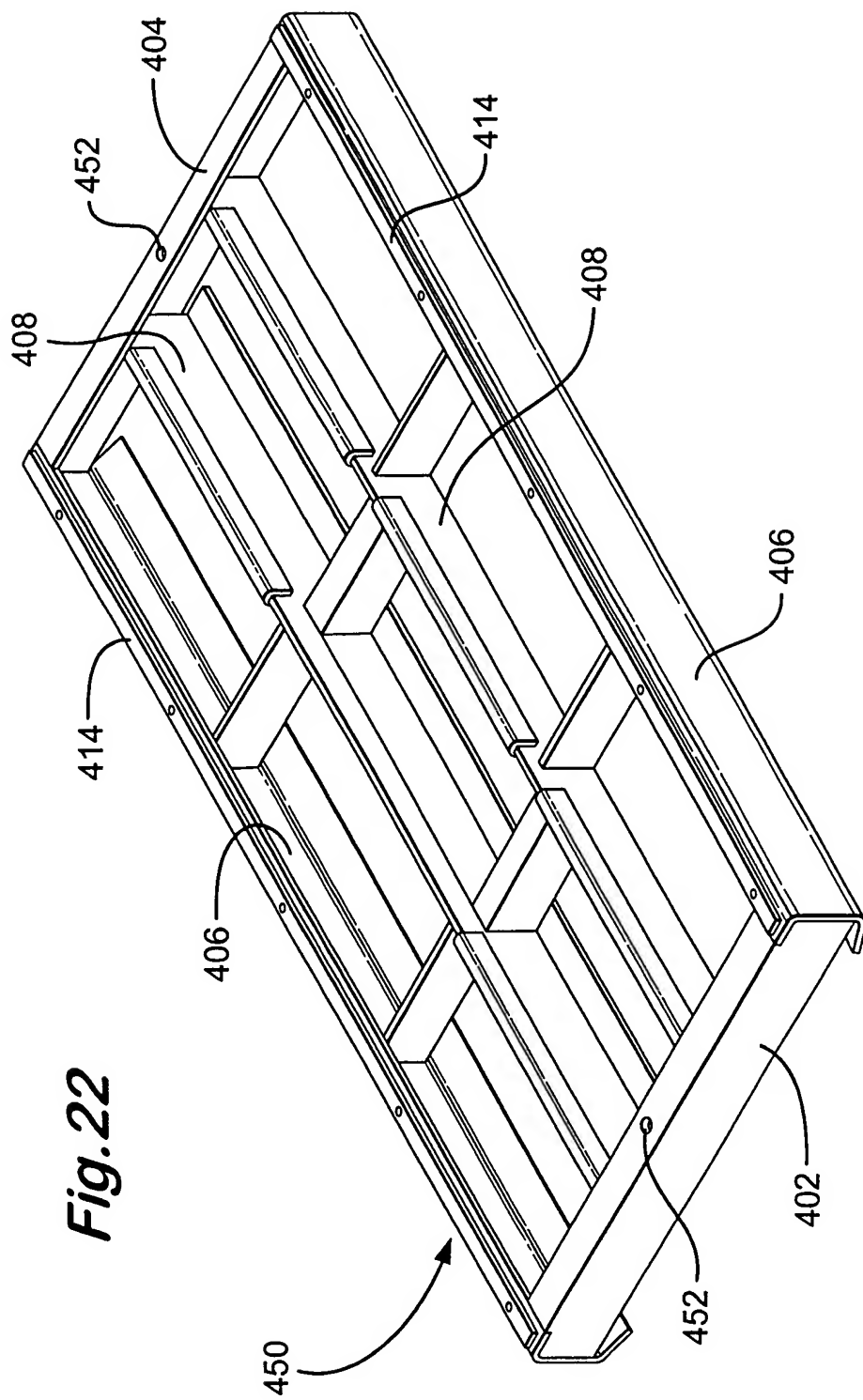
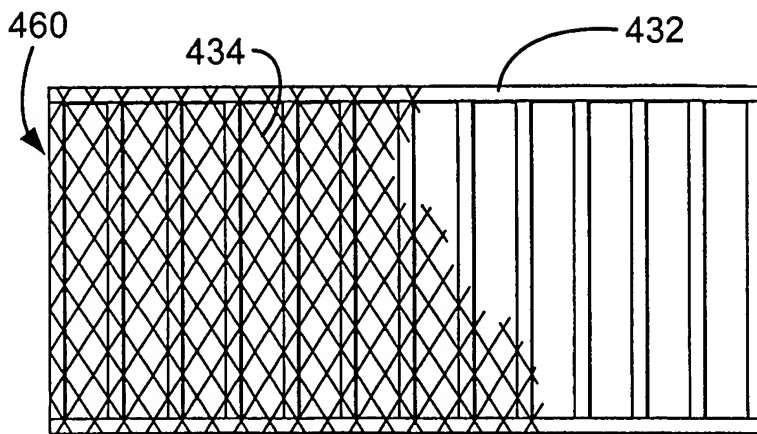


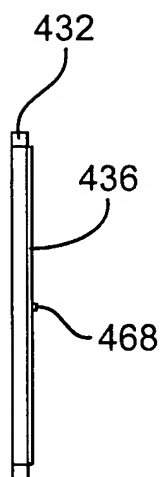
Fig. 21



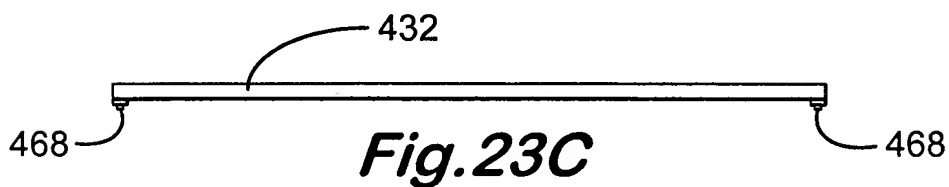
**Fig. 22**



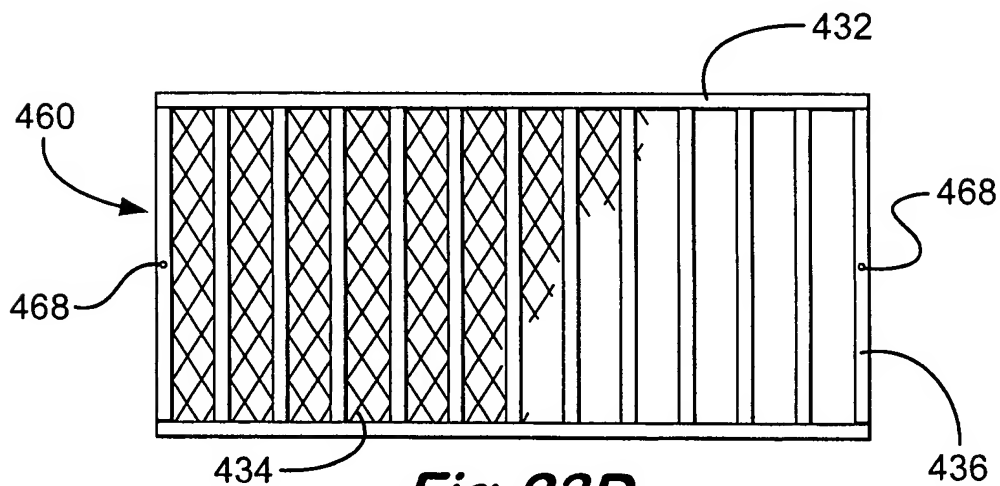
**Fig. 23A**



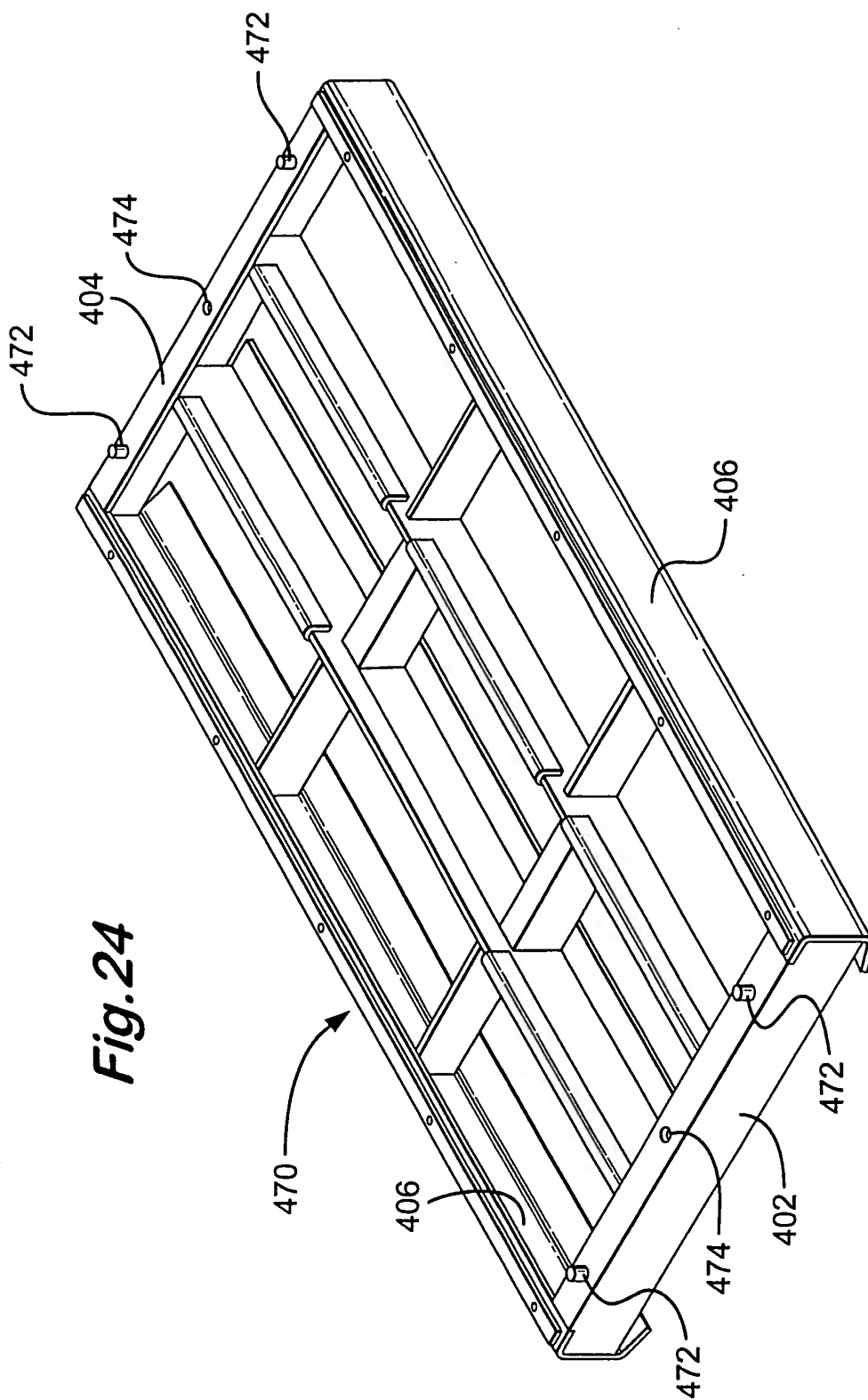
**Fig. 23B**



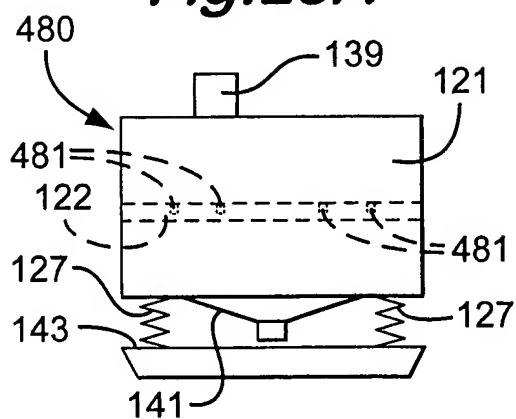
**Fig. 23C**



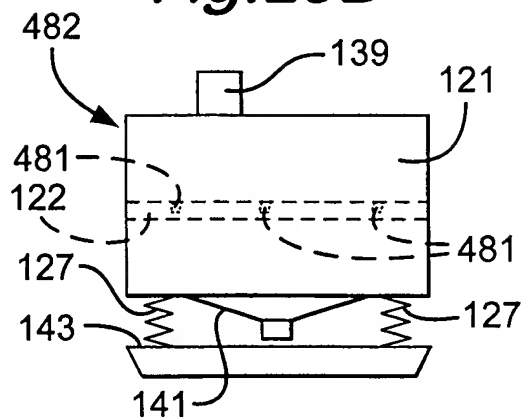
**Fig. 23D**



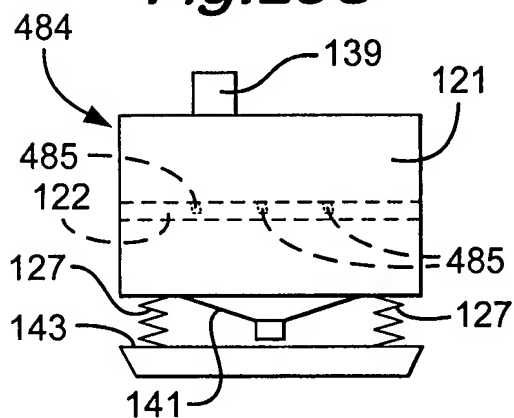
**Fig.25A**



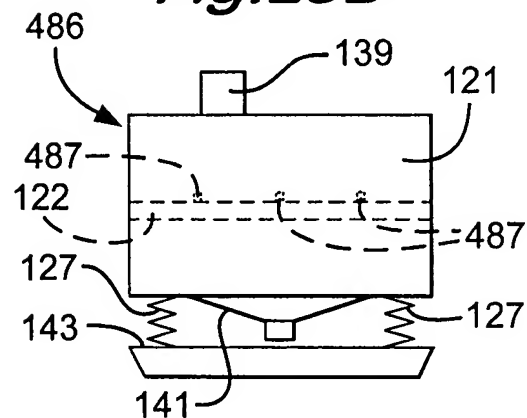
**Fig.25B**



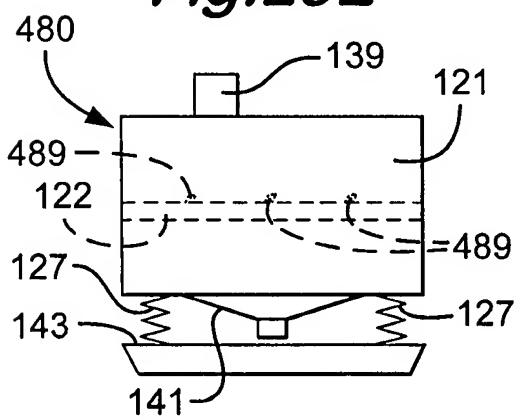
**Fig.25C**



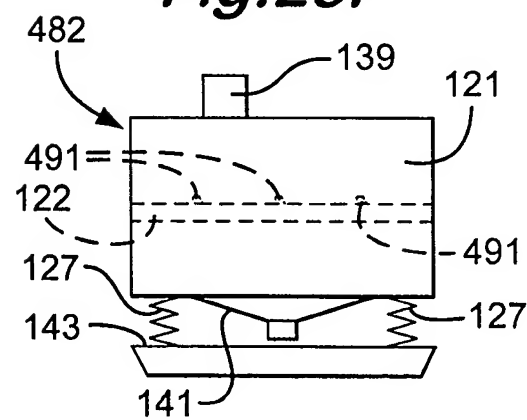
**Fig.25D**



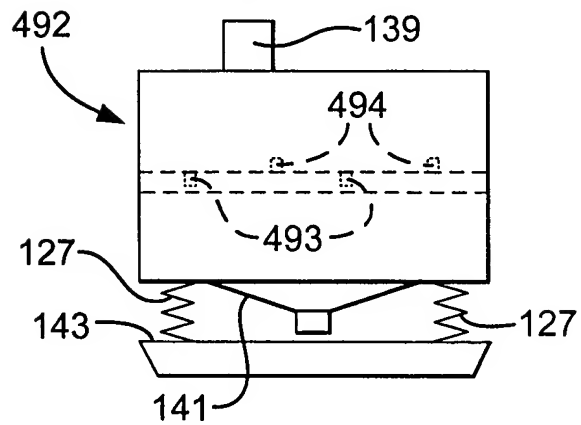
**Fig.25E**



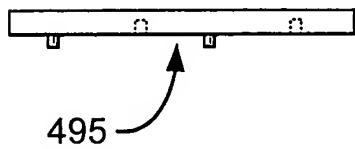
**Fig.25F**



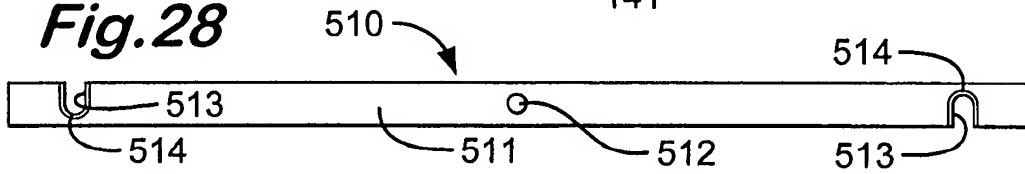
**Fig.25H**



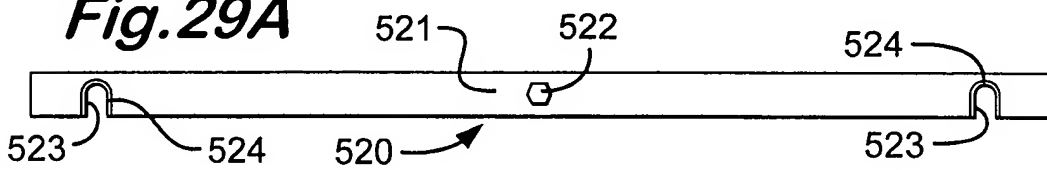
**Fig.25G**



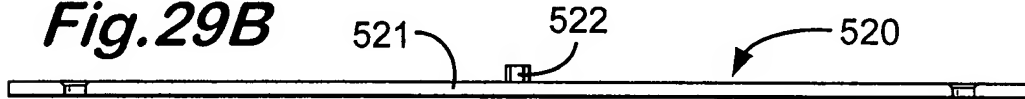
**Fig.28**



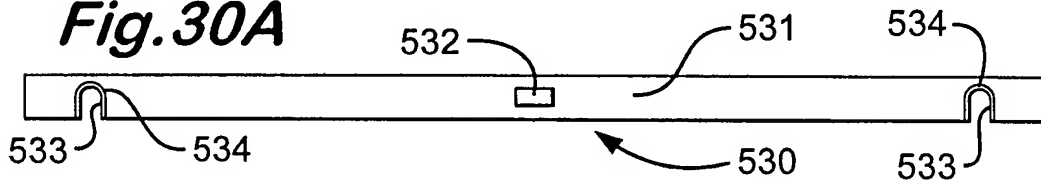
**Fig.29A**



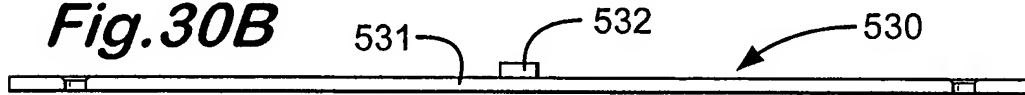
**Fig.29B**



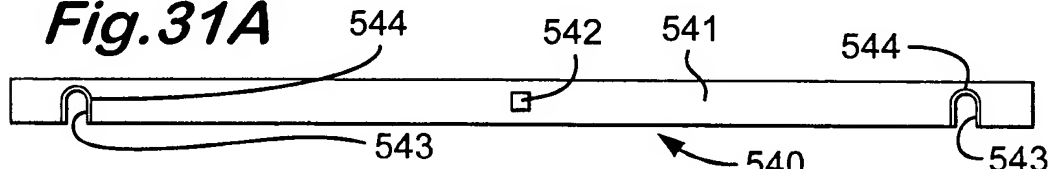
**Fig.30A**



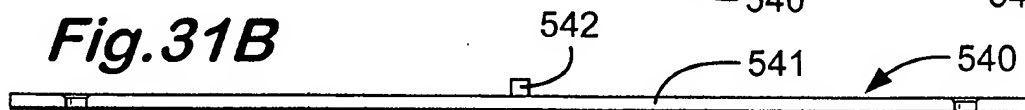
**Fig.30B**



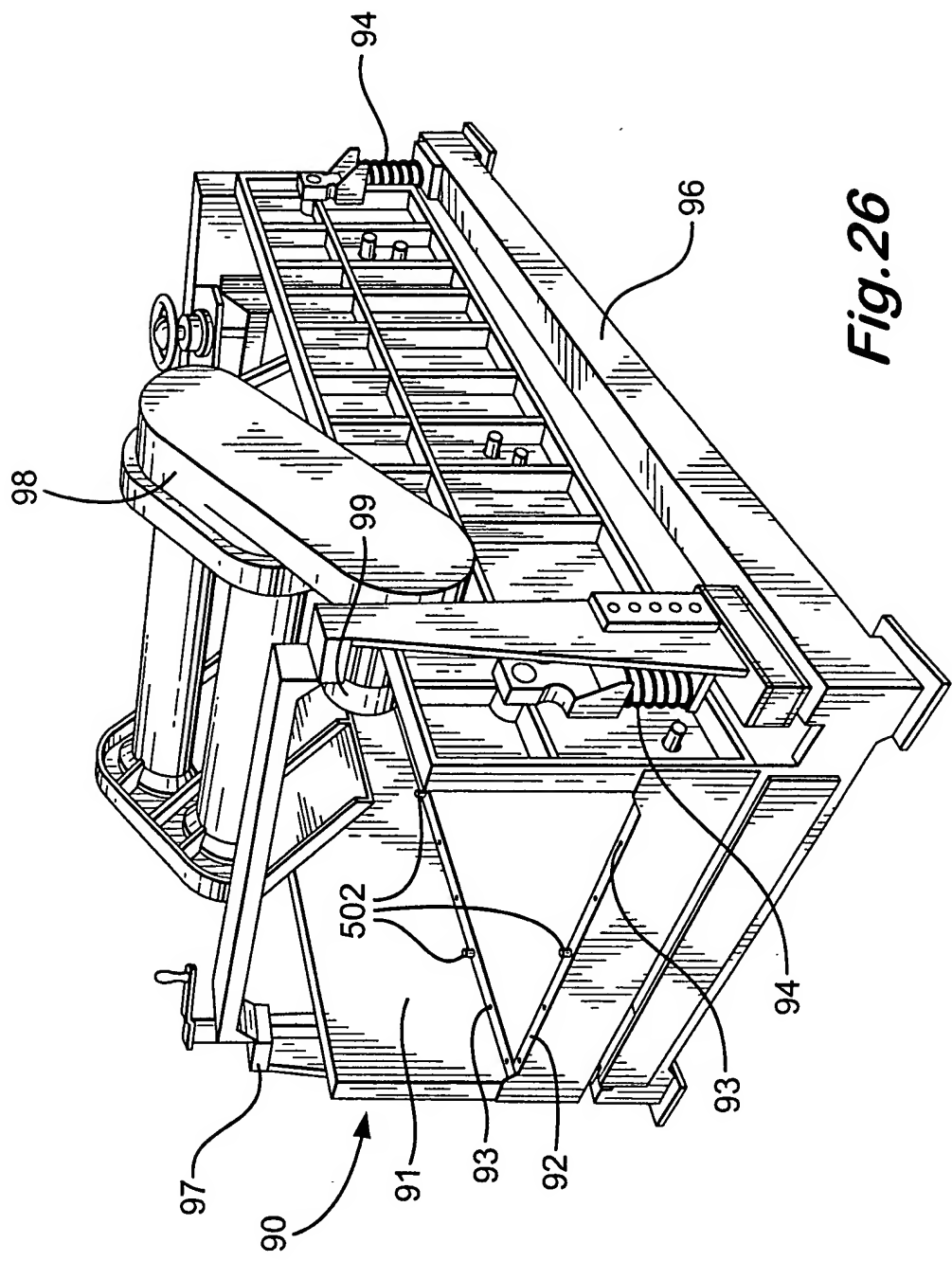
**Fig.31A**



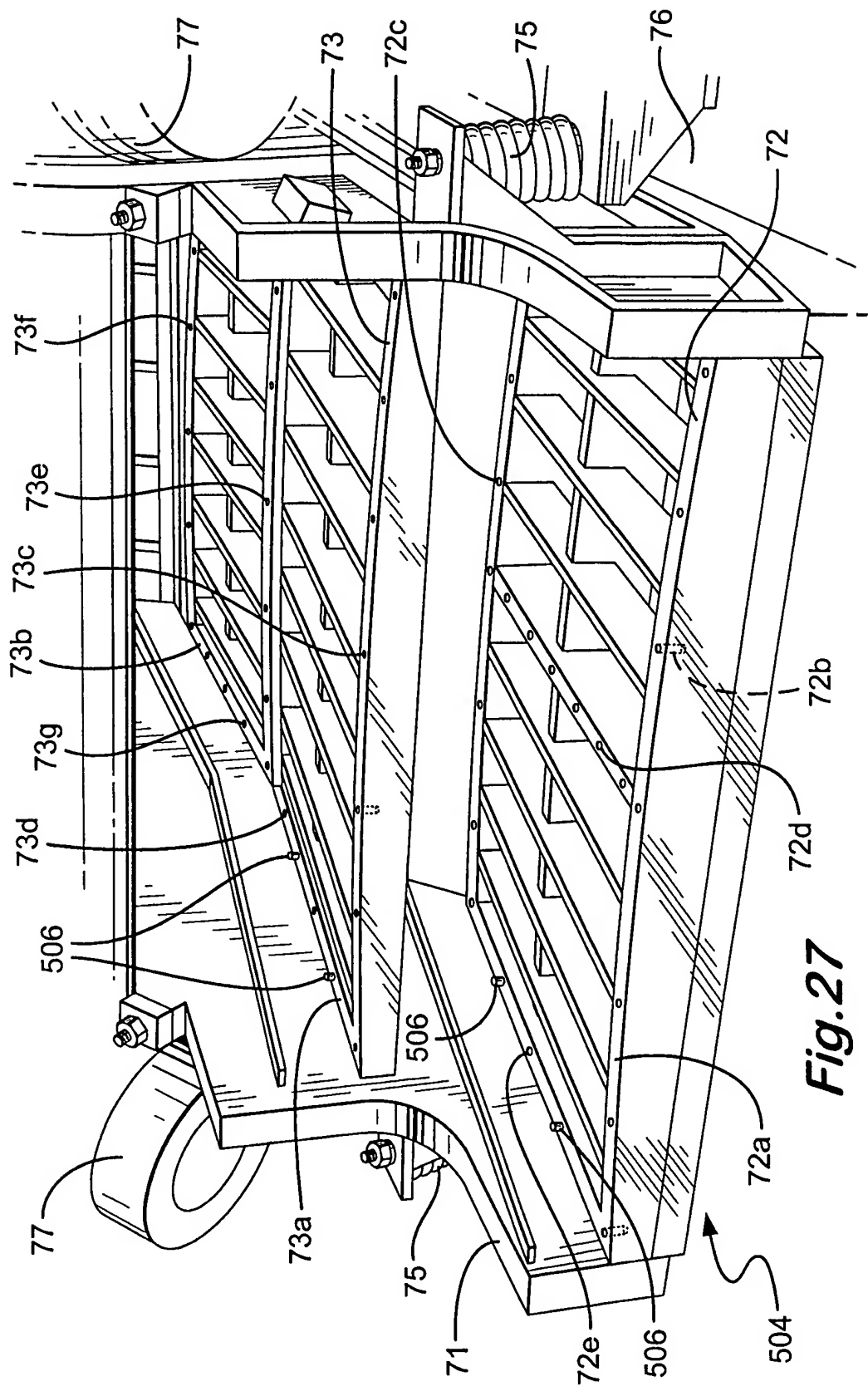
**Fig.31B**

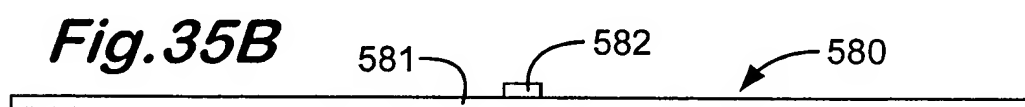
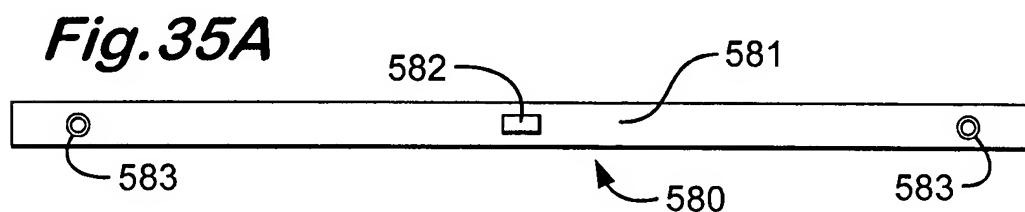
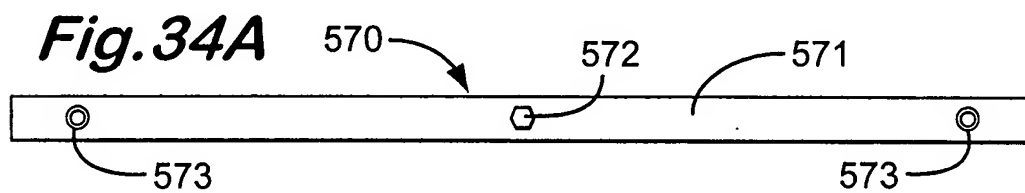
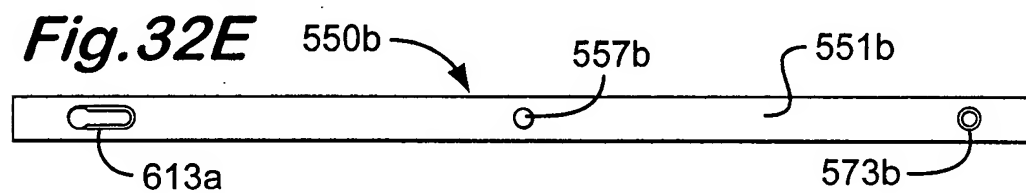
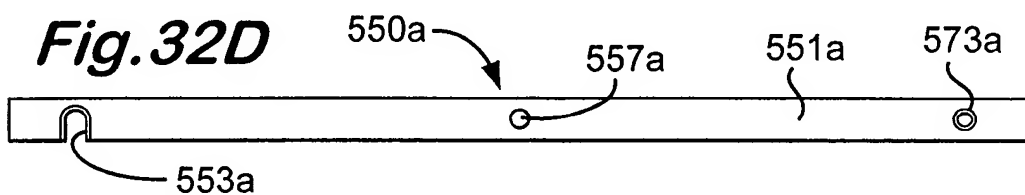
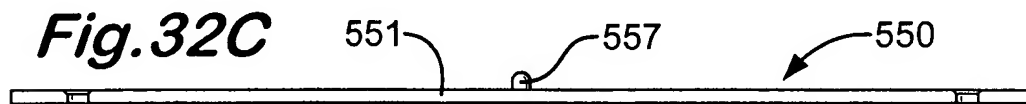
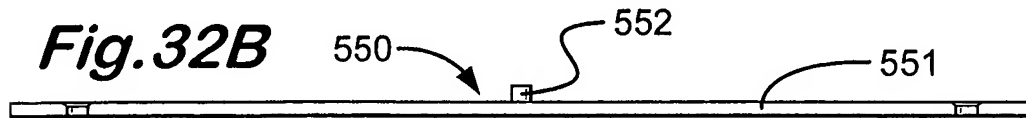
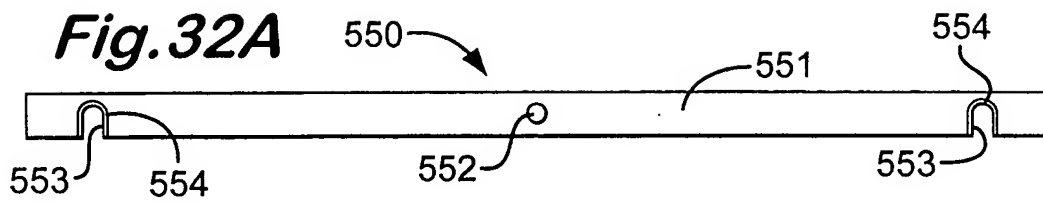


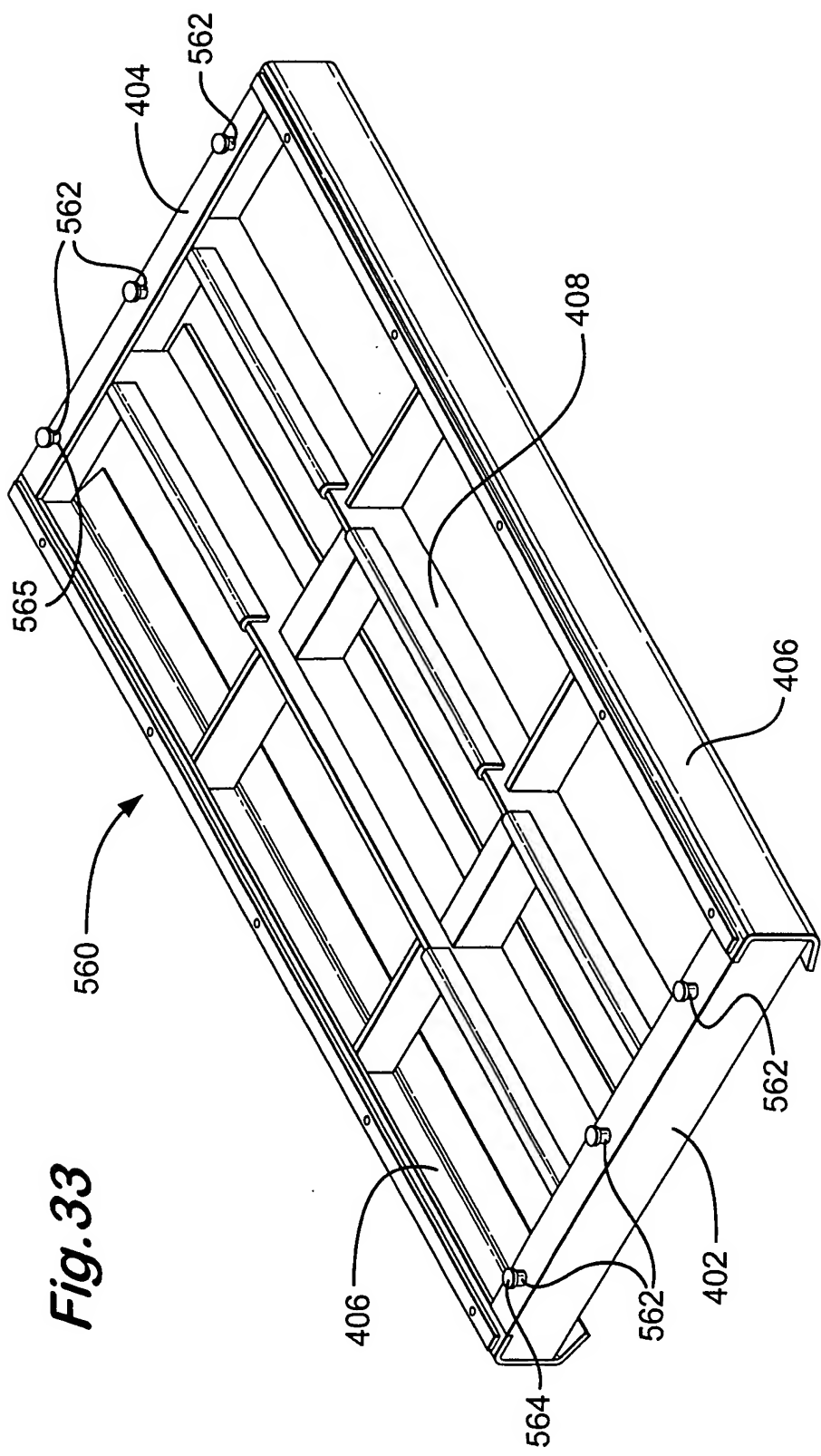




*Fig.26*

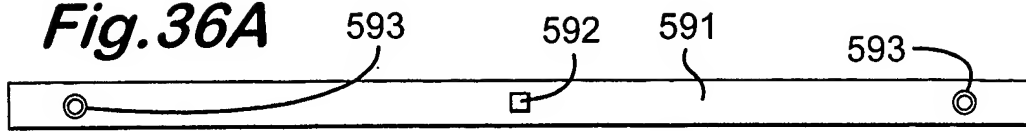




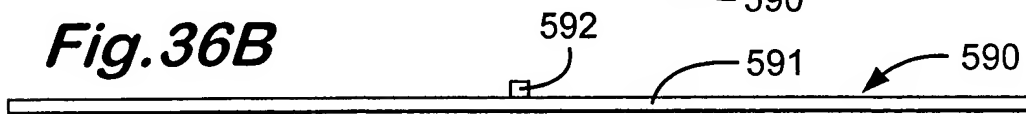


**Fig. 33**

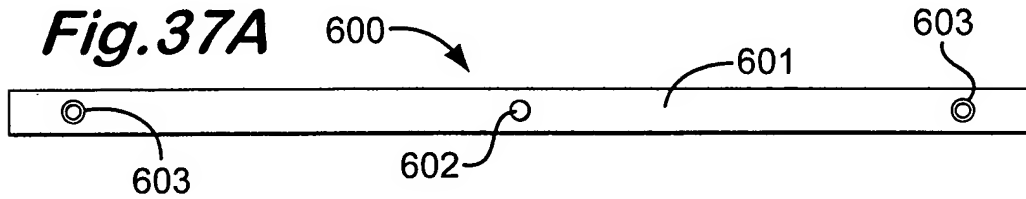
**Fig.36A**



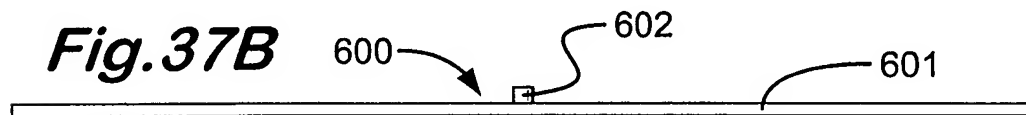
**Fig.36B**



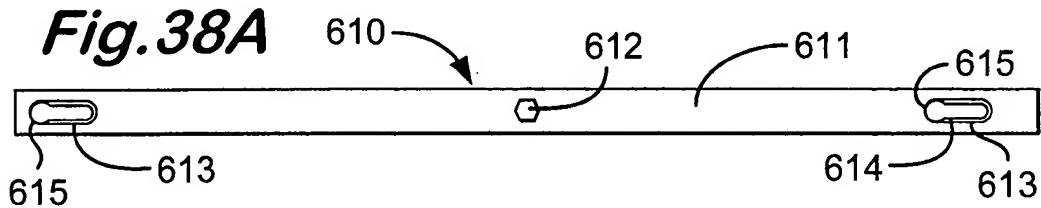
**Fig.37A**



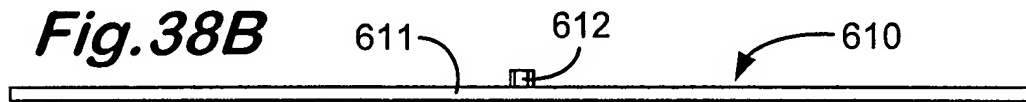
**Fig.37B**



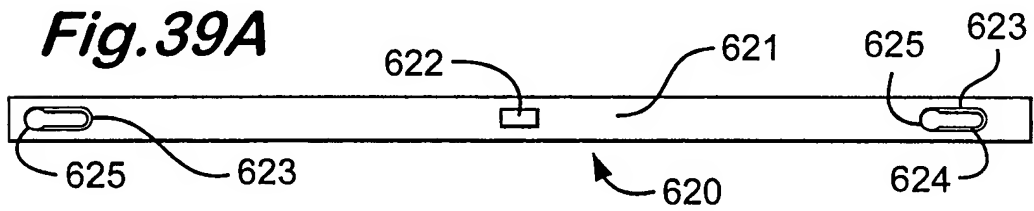
**Fig.38A**



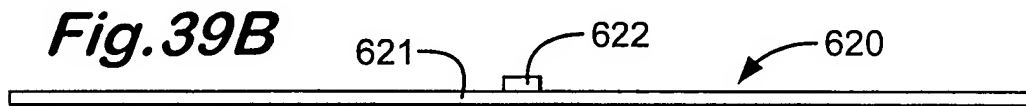
**Fig.38B**



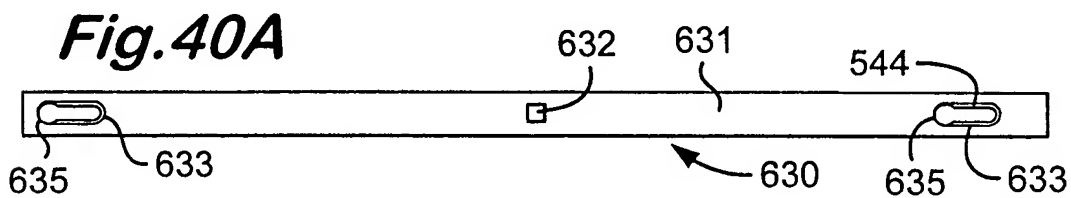
**Fig.39A**



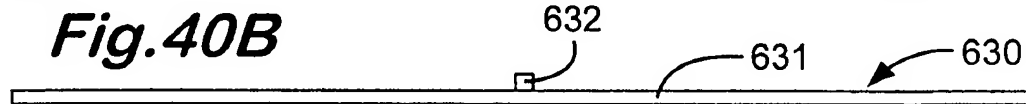
**Fig.39B**

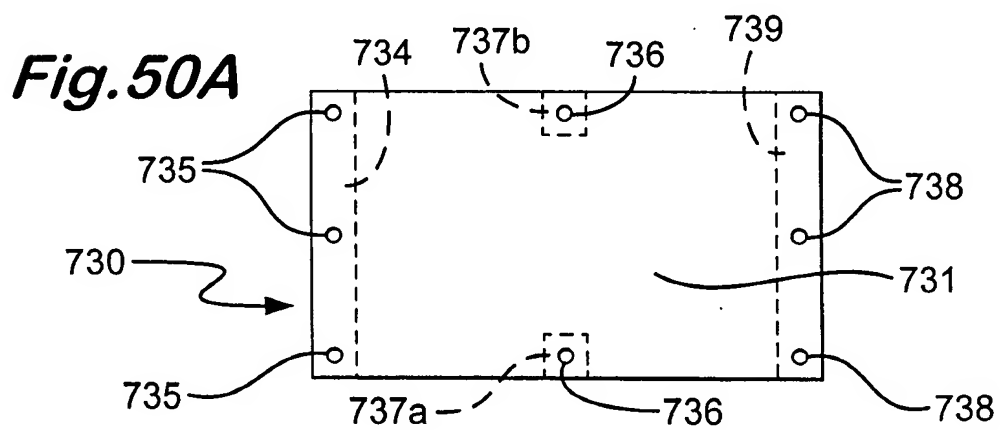
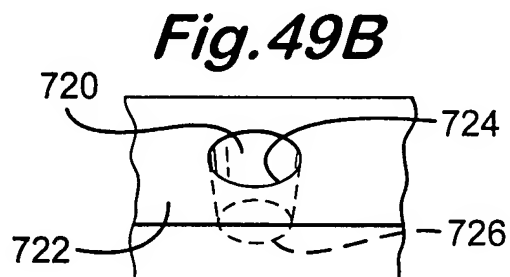
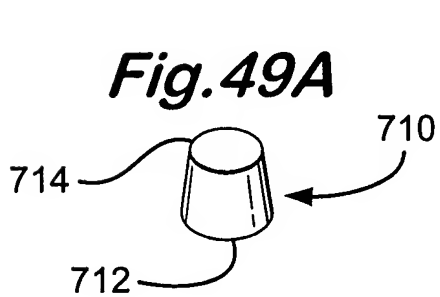
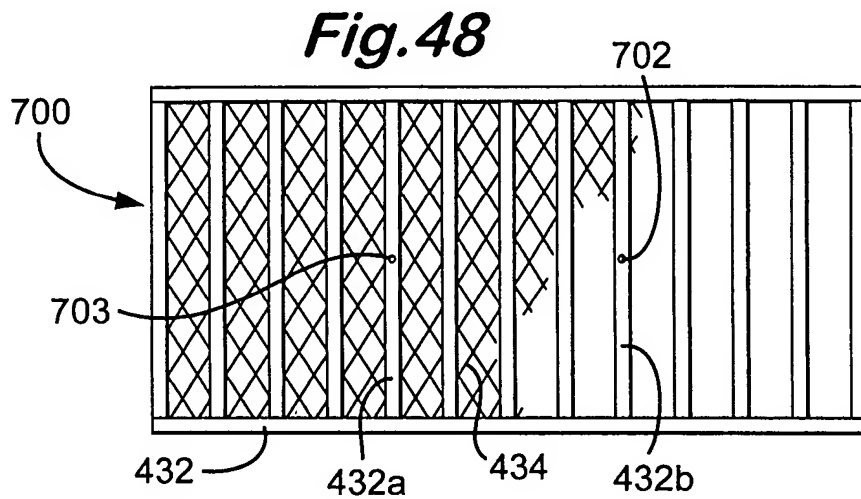
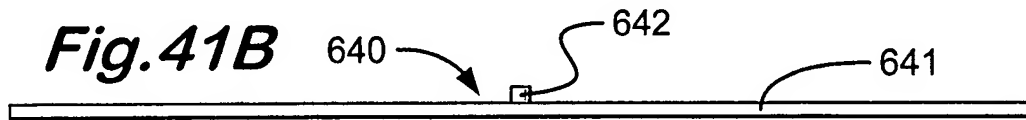
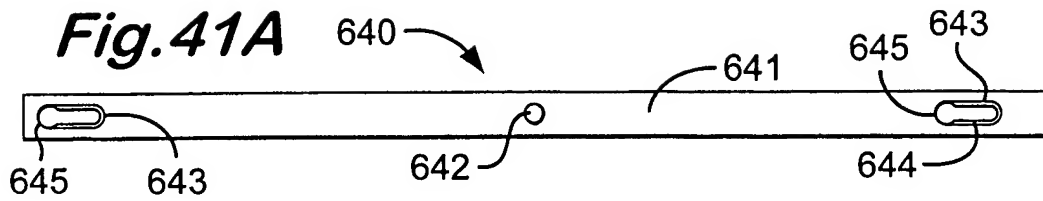


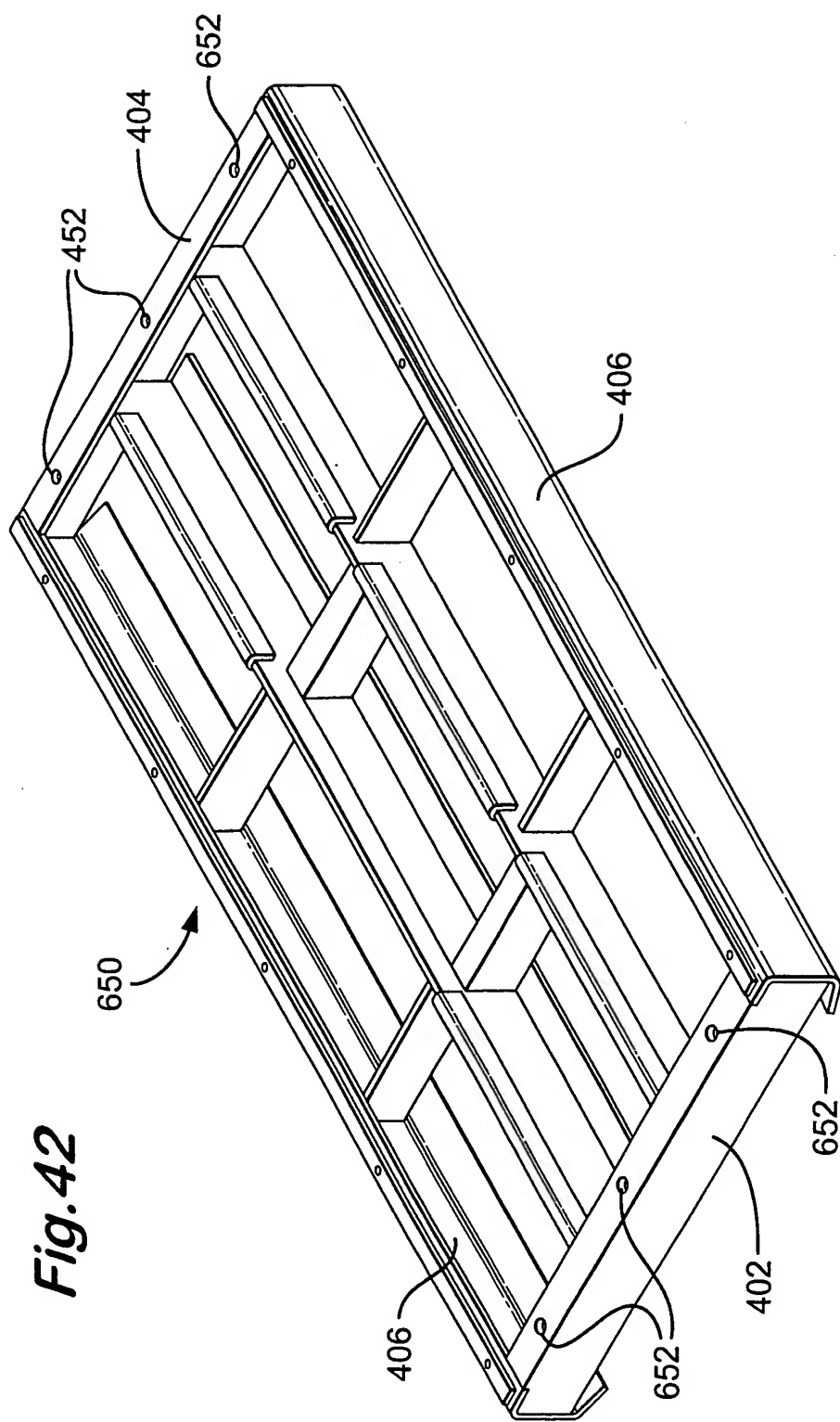
**Fig.40A**



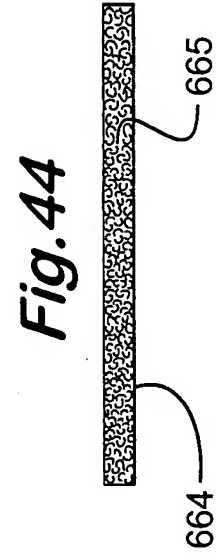
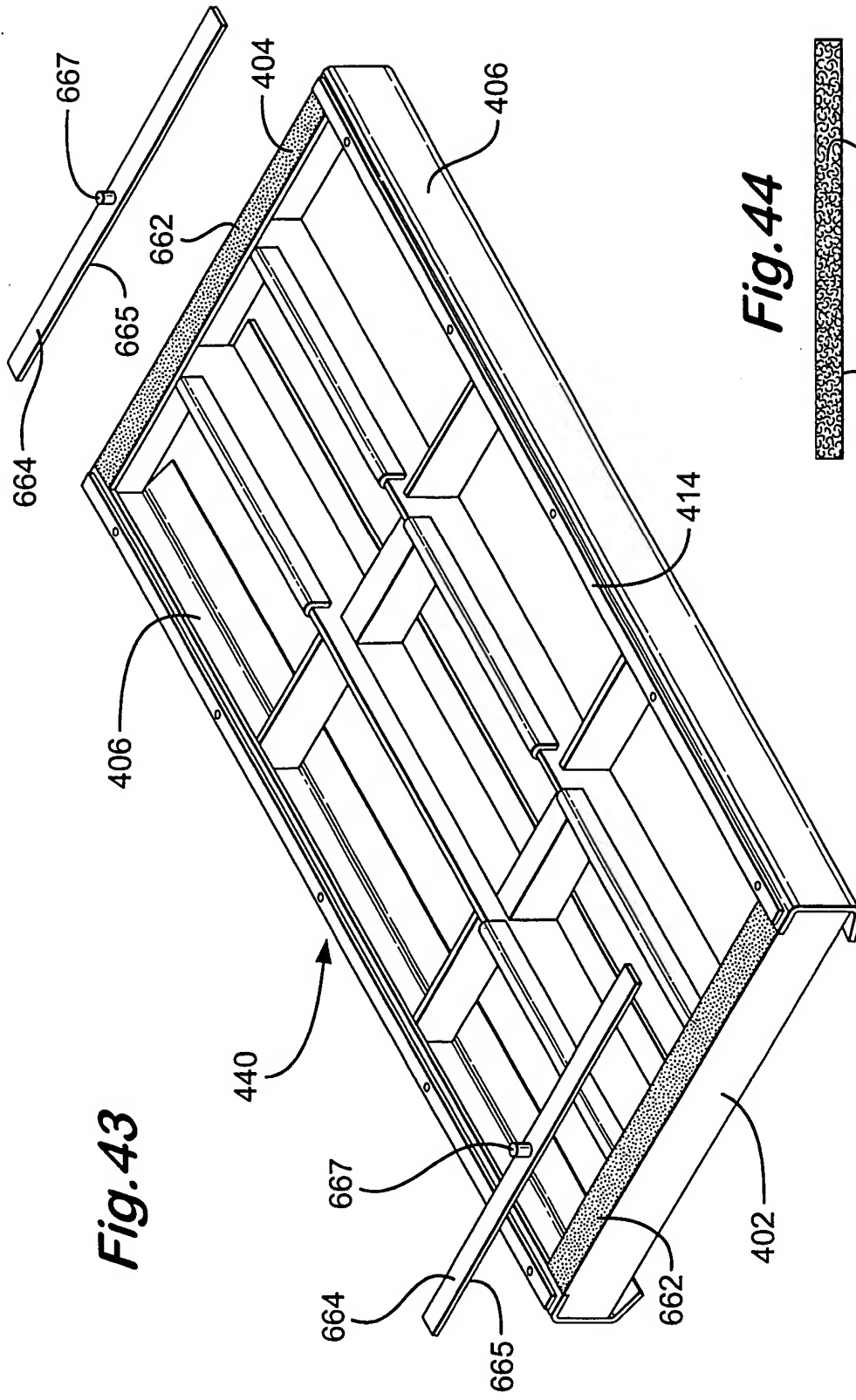
**Fig.40B**



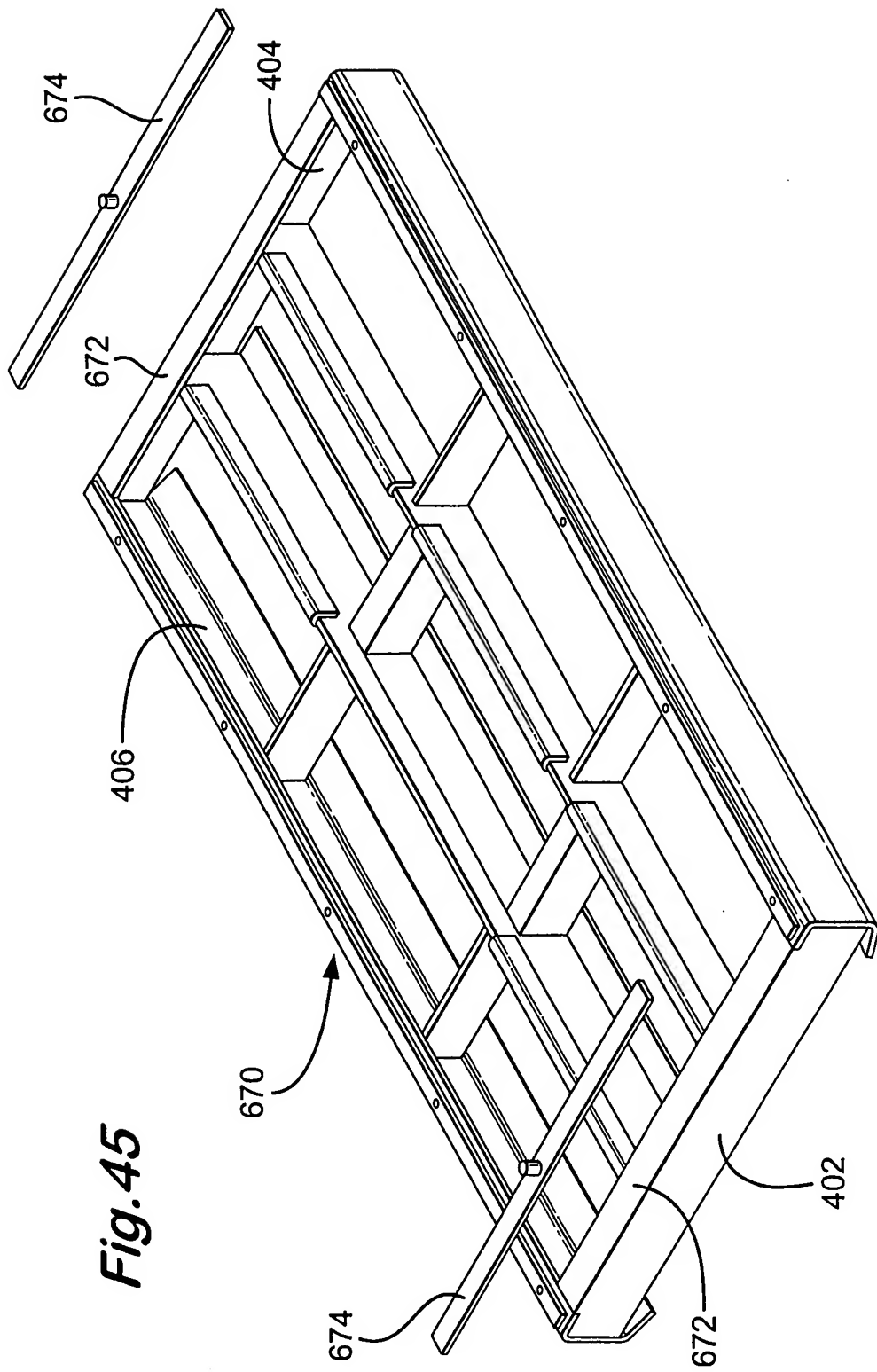




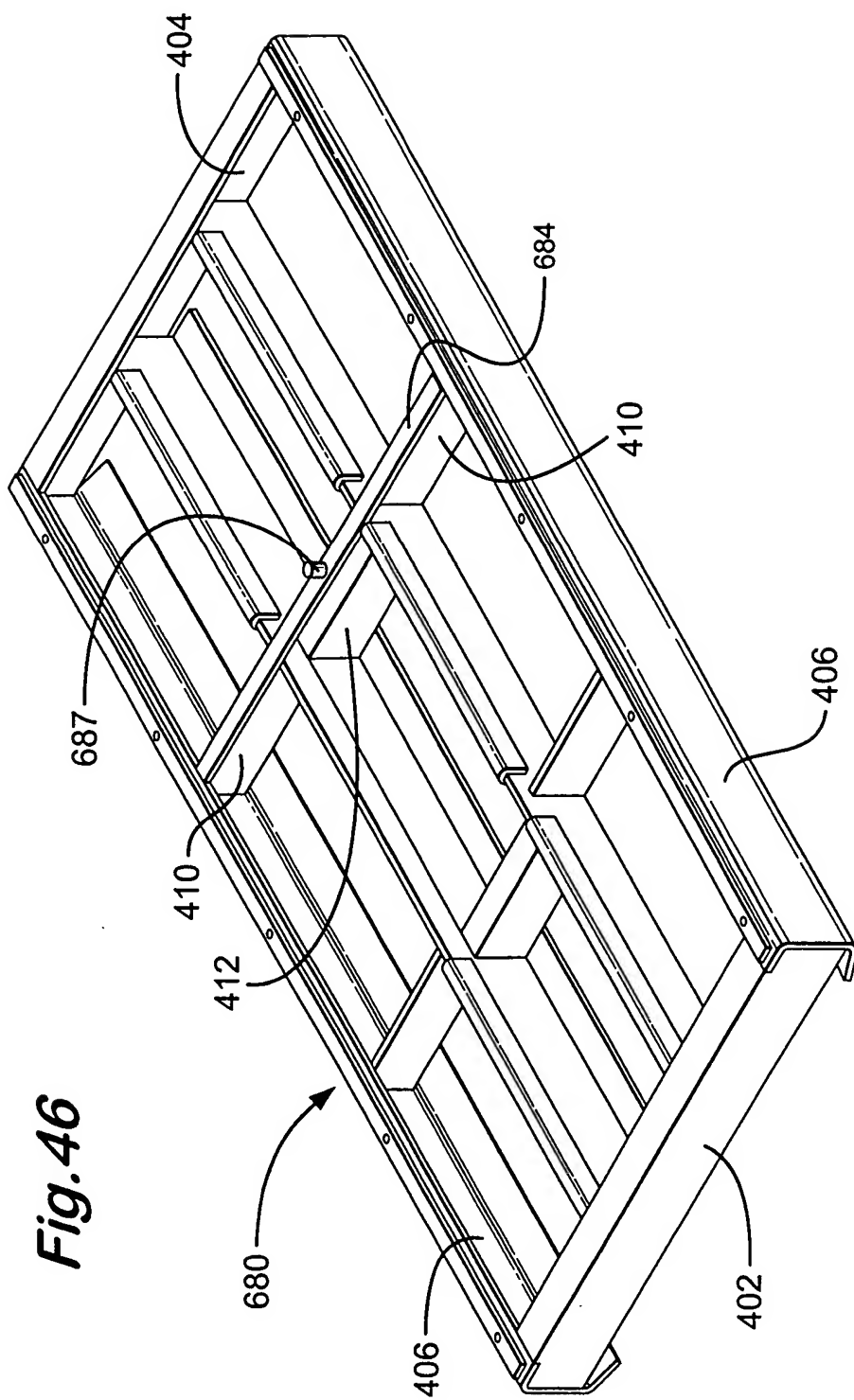
**Fig. 42**



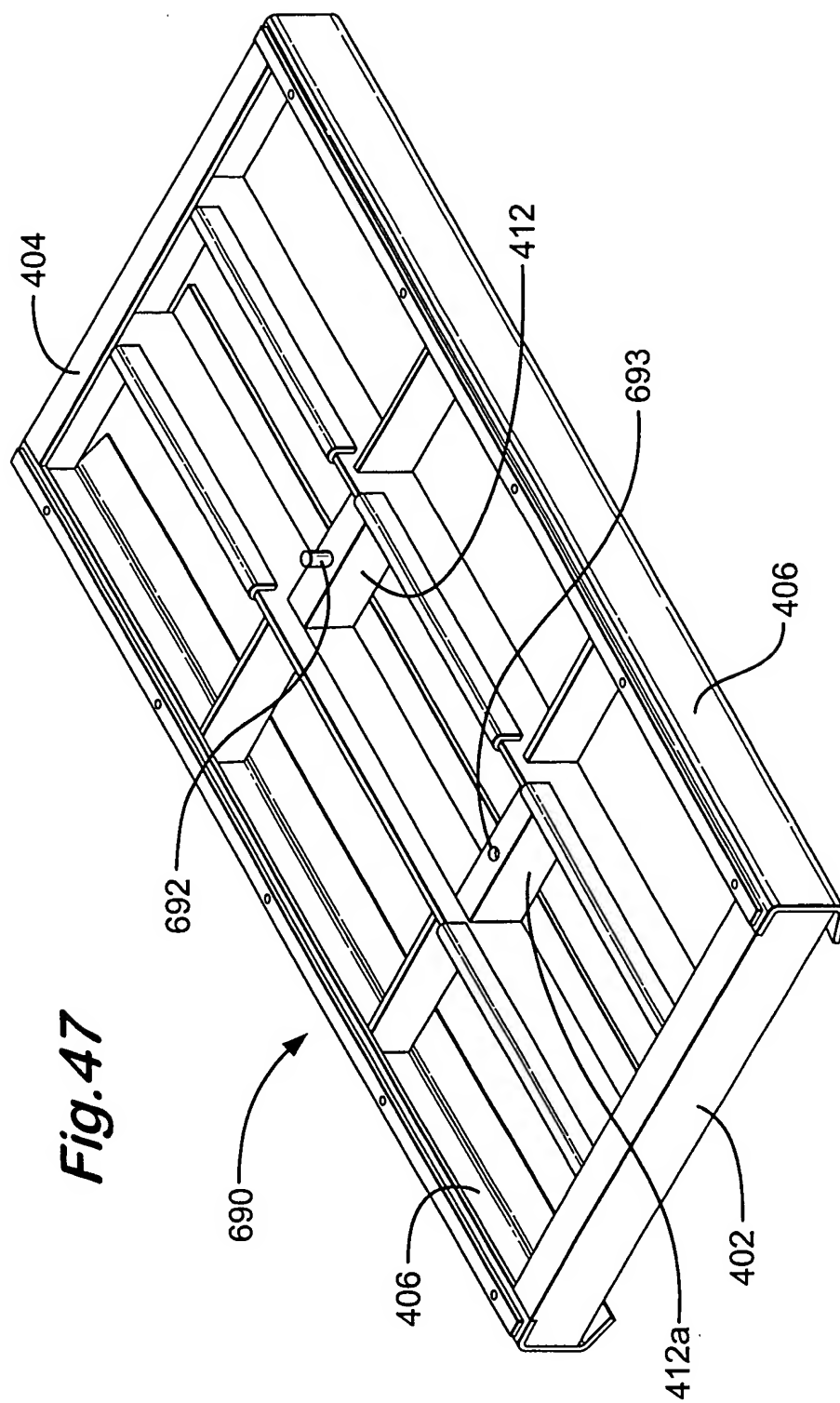




**Fig. 45**



**Fig. 46**



**Fig. 47**

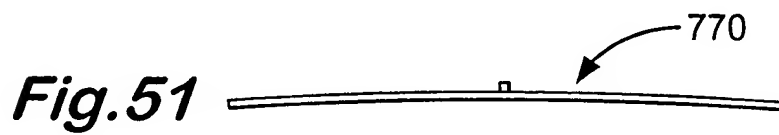
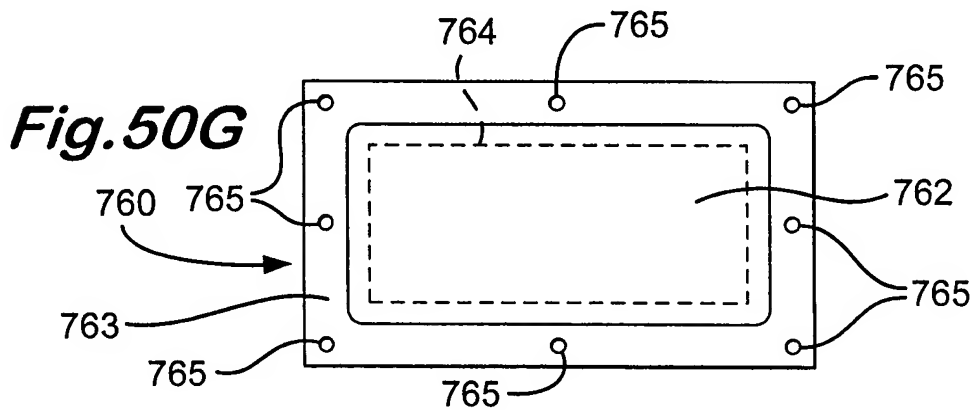
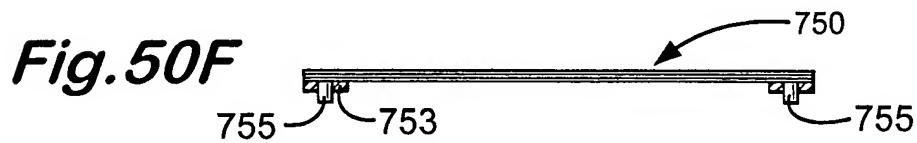
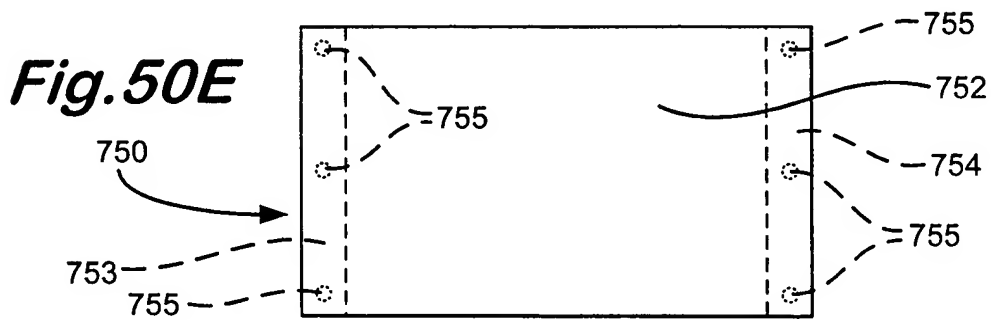
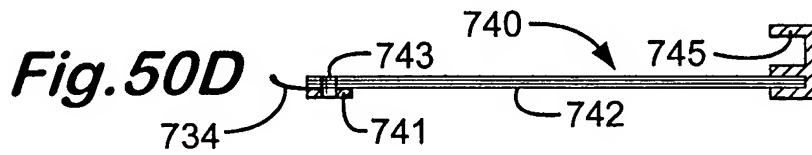
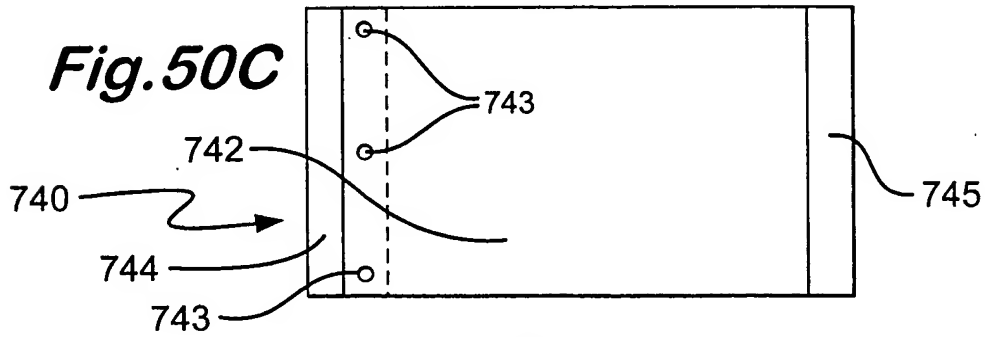
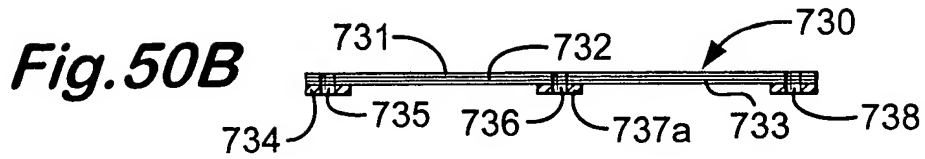


Fig. 52

PRIOR ART

5A→

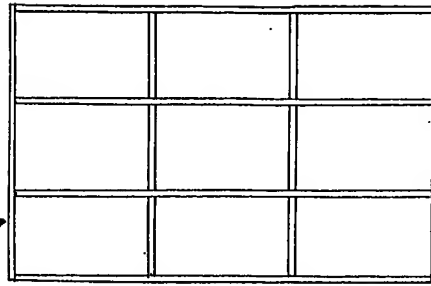


Fig. 53A

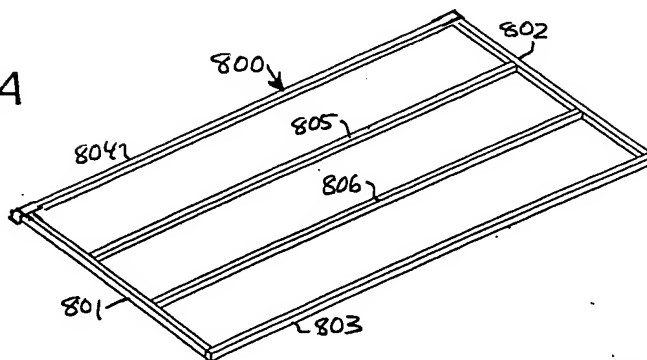


Fig. 53B

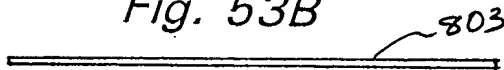


Fig. 53C

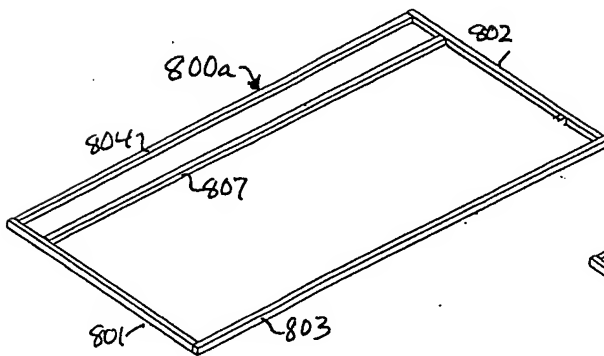
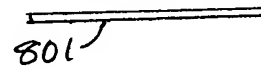


Fig. 54A

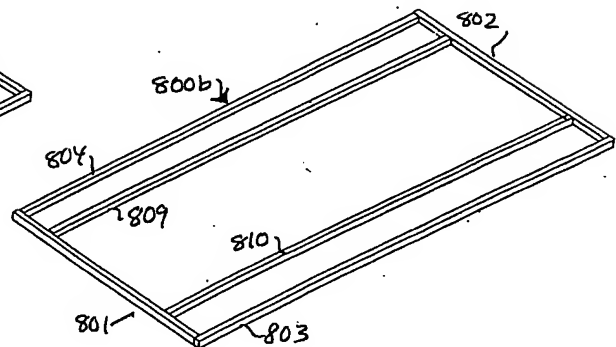


Fig. 54B

Fig. 54C

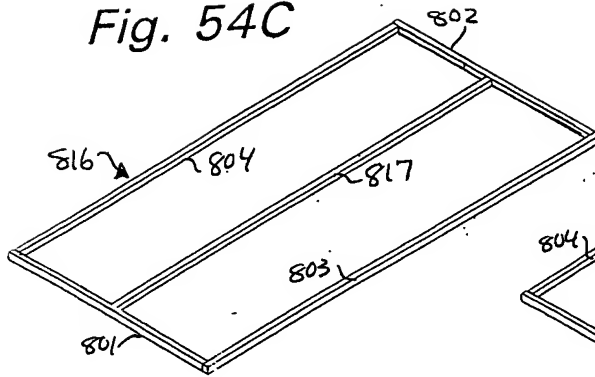


Fig. 54D

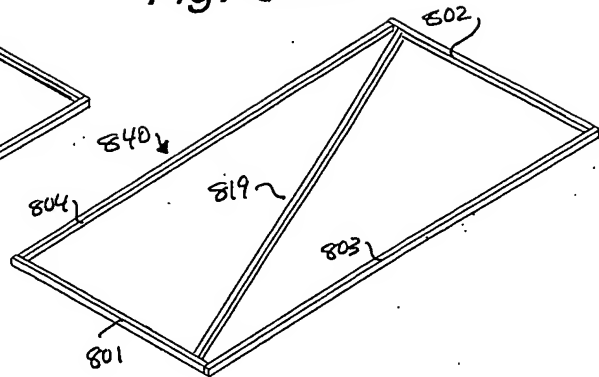


Fig. 55A

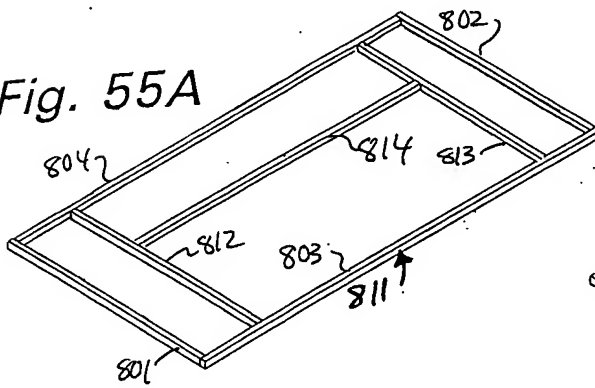


Fig. 55B

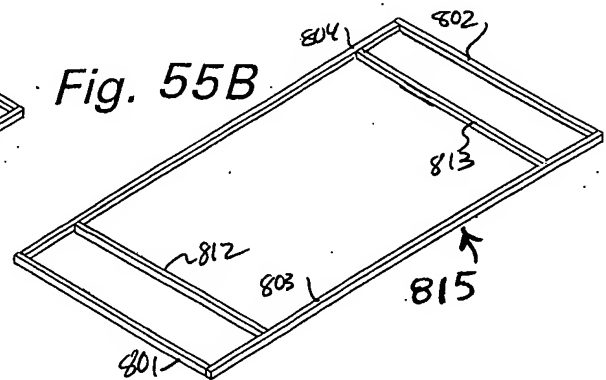


Fig. 56

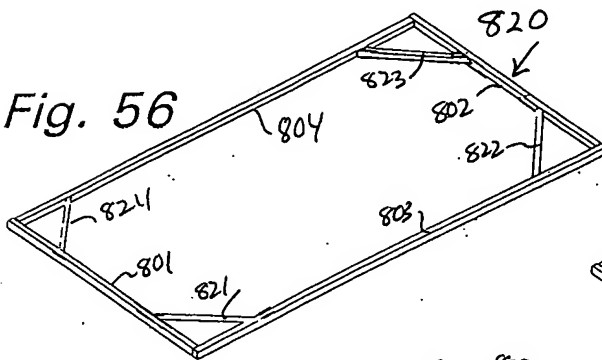


Fig. 57A

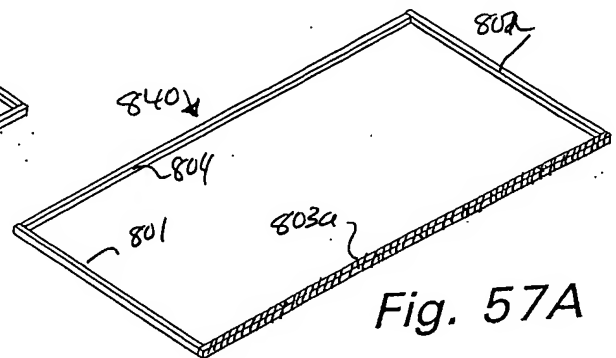


Fig. 57B

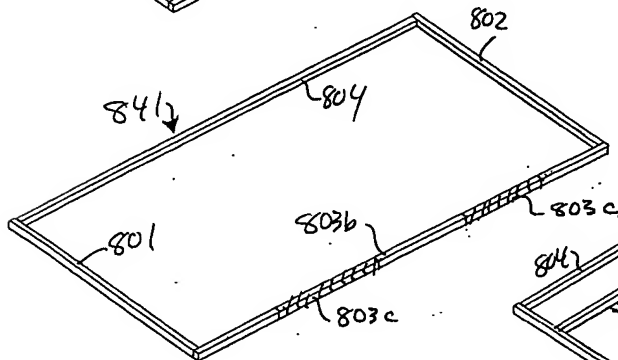


Fig. 58

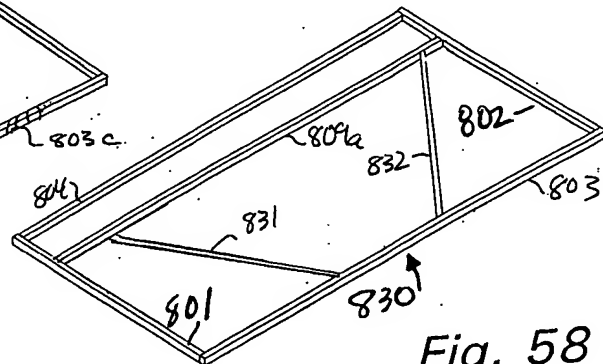


Fig. 59

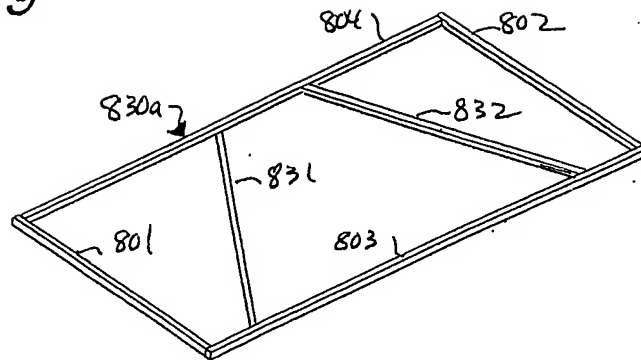


Fig. 60A

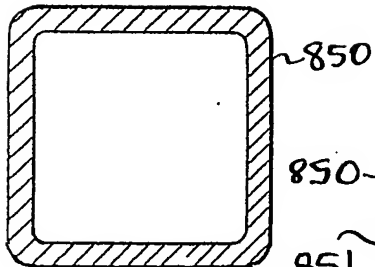


Fig. 60B

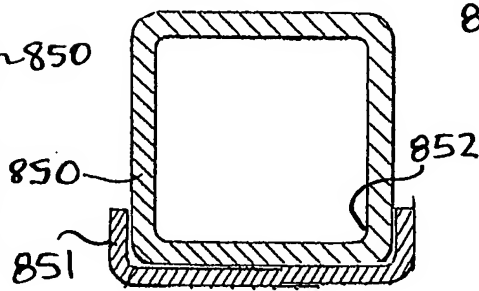
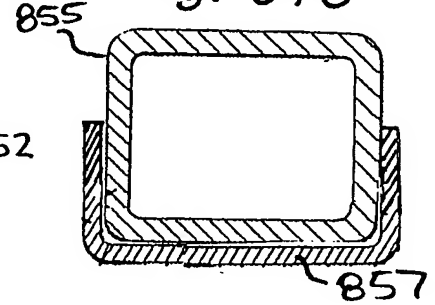


Fig. 61C



855 Fig. 61B

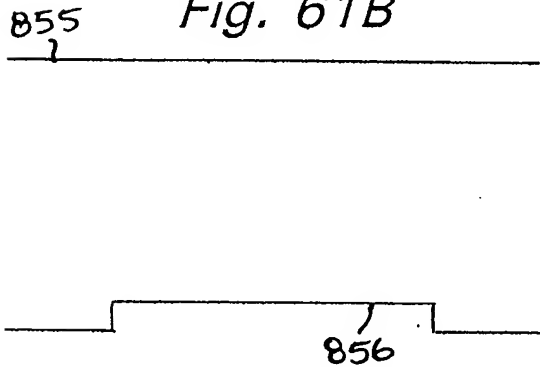


Fig. 61A

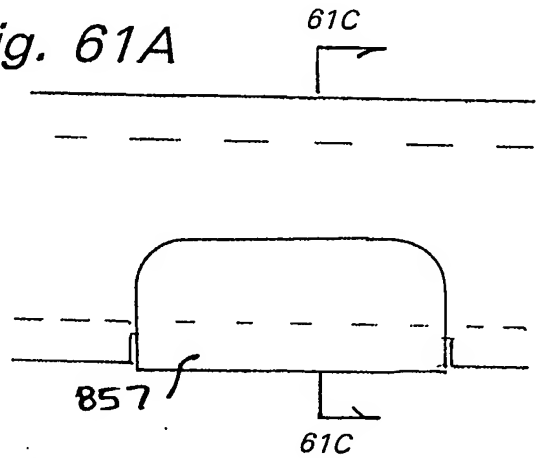


Fig. 62

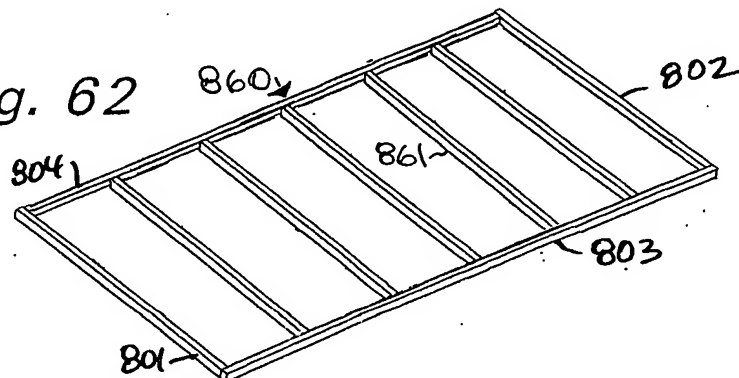


Fig. 63A

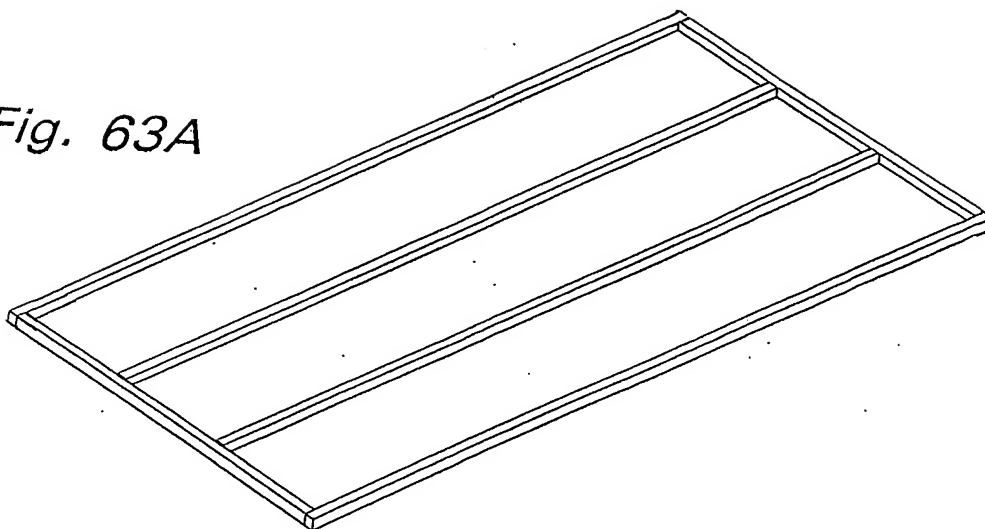


Fig. 63B

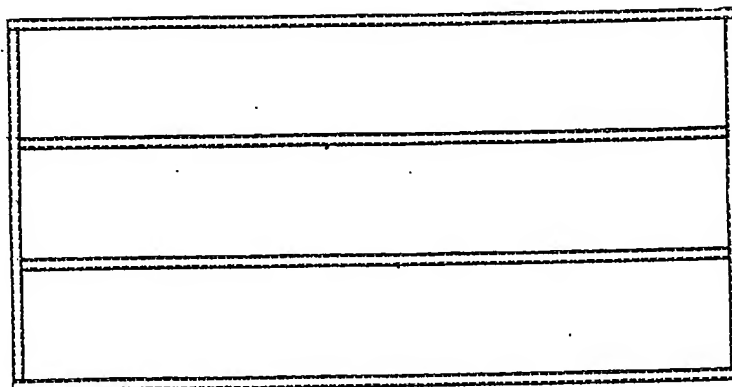


Fig. 63C



Fig. 63D



Fig. 63E



Fig. 63F

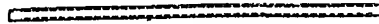


Fig. 64

